Main Catalog

Electricity meters
for modular enclosures and DIN rail

Power and productivity
for a better world™

Introduction
DIN rail mounted electricity meters

Modular DIN Rail Products offer a wide range of functions to be integrated in electrical installations with significant benefits for the user. DIN rail mounted electricity meters are designed for high level performance and are safe and fast to install.

The DIN rail mounted electricity meters are available in five product lines: ODINsingle and DELTAsingle for single phase metering and ODIN, DELTAplus and DELTAmax for three phase metering.

The meters are available in several configurations to suite many applications.

ABB Low Voltage Products

The Low Voltage Products division manufactures low voltage circuit breakers, switches, control products, wiring accessories, enclosures and cable systems to protect people, installations and electronic equipment from electrical overload. The division further makes KNX systems that integrate and automate a building's electrical installations, ventilation systems, and security and data communication networks. All these products help customers to save energy, improve productivity and increase safety.

Global business

The Low Voltage Products division is a global business producing mainly low-voltage electrical equipment that is sold to wholesalers, original equipment manufacturers as well as system integrators, and has moderate service requirements.

ABB's broad program of standardized products and components are the 'building blocks' of system solutions, incorporating functionalities that will allow seamless integration in real-time automation and information systems. At the product level, all the low voltage products can operate together perfectly.

To create a system solution, every product is equipped with the tools necessary to install, operate and maintain it efficiently throughout the product life cycle.

The range of low voltage products is supported by technical documentation. This together with compact design makes it easier than ever to incorporate our products in your system.

Our customers can find all product related documentation such as brochures, catalogues, selection program, certificates, drawings and other information directly at **www.abb.com/lowvoltage.**

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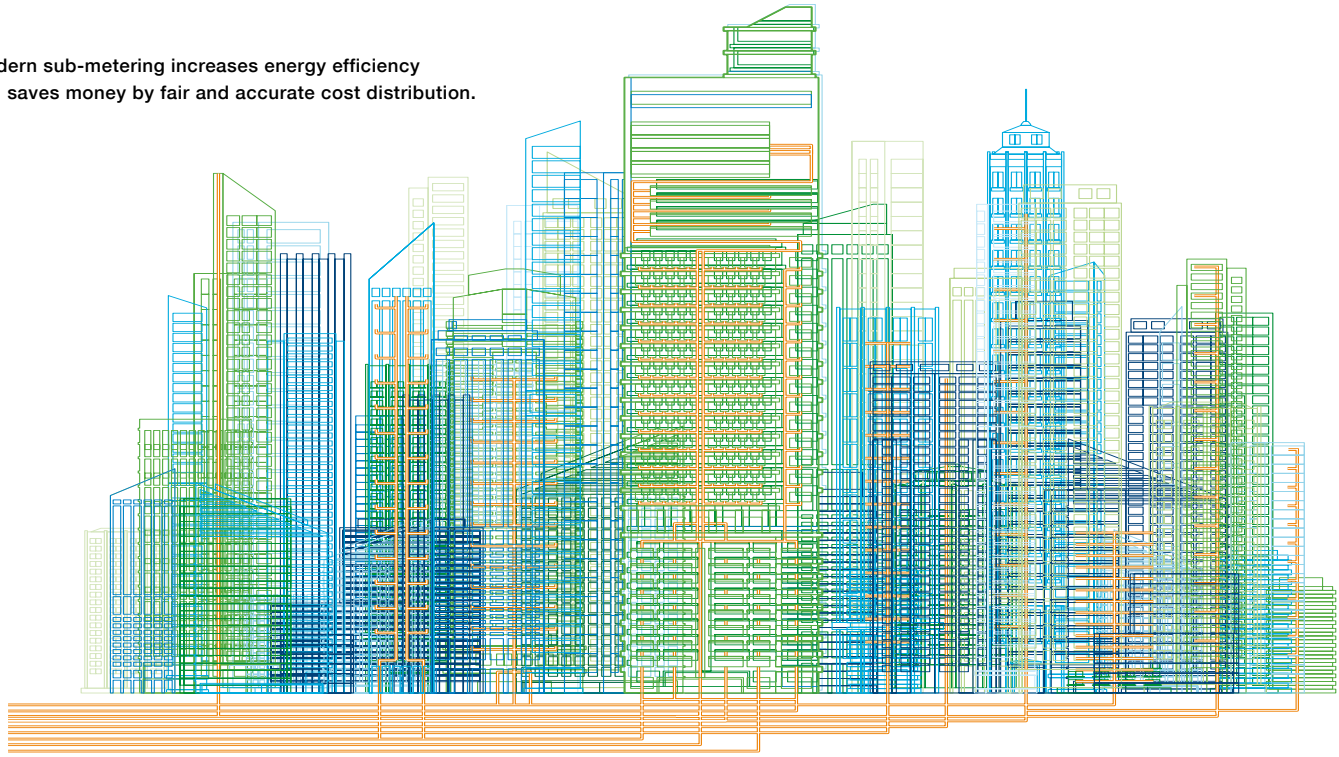
Applications in commercial buildings

Modern sub-metering increases energy efficiency and saves money by fair and accurate cost distribution.



Requirements for a deliberate strategy to manage and control energy consumption are having an increasing impact on commercial buildings such as shopping centers, offices, hotels and airports.

Electricity meters in commercial buildings are usually acquired by the property owner and read automatically via a facility or building management system. In the same way as much private property, e.g. housing associations and the like, modern sub-metering can increase energy efficiency and save money by more effective cost distribution. One significant difference is that the savings in commercial properties can naturally be much greater.

MID-approval facilitates problem-free cost distribution

Strict approval criteria for the meters used in this application do not generally apply. Meters that are MID approved have the advantage of a certified and verified metering accuracy. This is important if discussions on the fairness of the cost distribution arise.

ABB electricity meters can easily help distribute consumption costs between different tenants, e.g. stores and boutiques in shopping malls, businesses in office blocks, or different airlines and functions (baggage handling, for example) at airports.

The fact that many commercial properties are not designed from the beginning for sub-metering presents no problem. ABB electricity meters fit neatly wherever they are needed, but installation in DIN rail mounted is preferable as these are usually prepared for DIN rail mounted devices.

Mandatory energy declarations require consumption to be separated

According to EU directive 2002/91/EC, commercial properties must now have an energy declaration that describes the building's energy performance. Its aim is to reduce the climate effect and increase the efficient use of energy, i.e. benefits for both society and the building owner.

Energy declarations require that the electrical consumption for lighting, elevators, heating and ventilation, etc., be accounted for separately. Data collected from individually-located meters (sub-metering) are extremely valuable in this respect. As well as being a legal requirement, it highlights ways to increase efficiency by locating unnecessary consumption, e.g. heated garage parking during summer months or ventilation in parts of the building that are largely unoccupied.

Max demand also cuts energy consumption

Measuring the highest average power during a set time interval (normally 15 min to one hour) results in the max demand value. Measuring max demand helps dimension a building's electrical installations to its use. It also helps cut consumption by more easily identifying time periods when consumption is very high so that appropriate measures to reduce it can be taken.

Industrial applications

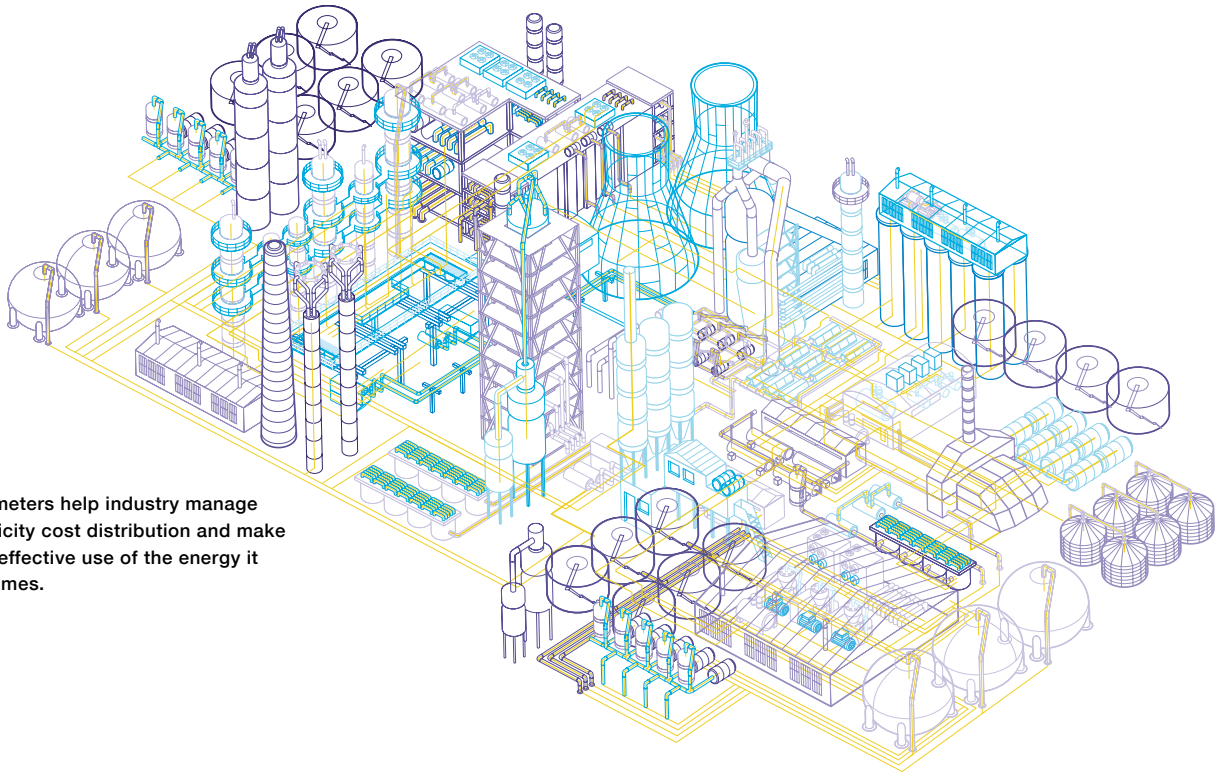


ABB meters help industry manage electricity cost distribution and make more effective use of the energy it consumes.

ABB electricity meters find many uses in industry, usually in one of three areas; cost distribution, effective use of energy, improved control. One common feature is that they generally interact with a plant's Energy Management System, which reads the meter and then forwards the result for further handling.

Meters used in industrial applications do not need special approval. Common sense, however, says that high-quality meters like ABB's are essential. That they should meet accepted international standards is also obvious. And as industrial plant owners frequently mount electrical equipment on DIN-rails, ABB electricity meters with this capability has a clear advantage.

Fair and flexible cost distribution

Industry faces a never-ending challenge to keep down its operating costs. One of the pre-requisites for achieving this goal is to first identify where costs occur. Only then can factory management draw up guidelines on how these should be allocated and who should pay for them, i.e. according to department, profit center or even individual products.

Meters help maximize energy efficiency

Making the most effective use of costly energy remains a key priority. Measuring the electrical consumption of equipment, especially heavy equipment, is a vital job for ABB electricity meters in this respect. For example, an unexpected increase in the energy use of an individual item can signal an urgent need for maintenance – and a return to more acceptable and budgeted levels.

Peak-shaving saves unnecessary extra costs

Many industrial contracts for electricity supply specify a maximum power that can be taken from the grid. Exceeding this level can mean costly extra tariffs, especially in energy-intense operations. Peak-shaving uses ABB meters to monitor electricity consumption and identify when penalty levels are at risk. In the long-term, industry wins by better-planned and more economic use of energy.

Max demand also cuts industrial energy consumption

Measuring the highest average power during a set time interval (e.g. 15 min to one hour) results in the max demand value. Using ABB meters to measure max demand helps cut consumption by more easily identifying time periods when energy use is very high so that appropriate measures to reduce it can be taken.

Mitigating the effects of harmonic distortion

Harmonic distortion is the change in the waveform of the supply voltage from the ideal sinusoidal form. The phenomenon can adversely affect industrial equipment such as induction motor windings, transformers and capacitors. What's more, its effects may go unnoticed for years.

Reducing harmonic distortion first requires a harmonic analysis, and here ABB meters have an important role to play.

Object metering

“To measure is to know”

Electric bills keep getting bigger and bigger, and increased consumption probably plays a bigger part than higher prices. At home and at work, energy-hungry items like computers, terminals, servers, climate-control equipment and intense lighting all push up costs. One of the simplest ways to save money and energy is to make electricity consumption more visible – via object metering.

Object metering is metering individual commercial freezer, lighting, machines, power-consuming objects such as air-conditioning fans or heating pumps. Its aim is to show electricity use where it occurs, thereby increasing energy awareness and helping change consumer behavior.

Simple, MID-approved meters are preferred

Object metering requires no special approval but an approved, high-quality meter rather than a non-approved will always be preferable.

Easy installation in standard enclosures together with MCB protection

ABB’s compact electricity meters are easy to install in standard enclosures. This is especially important in object metering since objects in domestic, commercial and industrial applications require line protection devices, and these are generally mounted in standard enclosures.

Long list of domestic objects

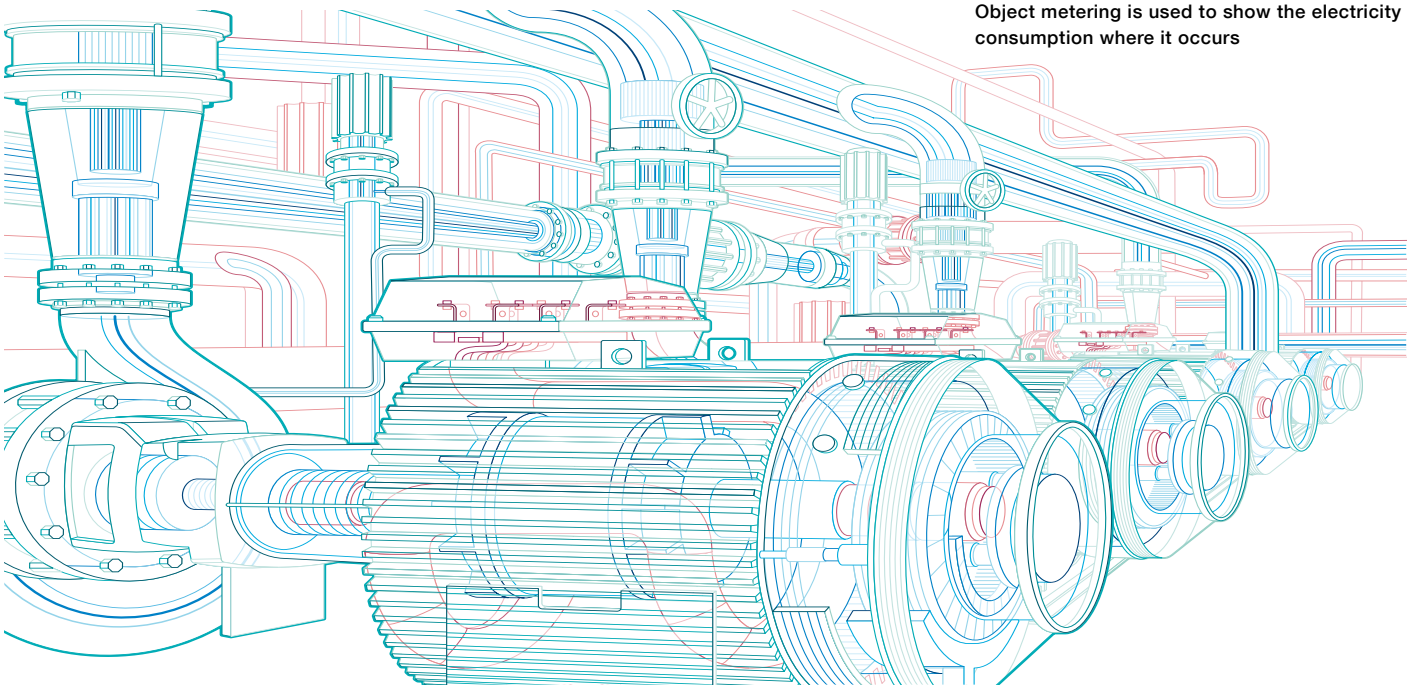
Heating and ventilation pumps are obvious candidates for object metering in the home, and these can be joined by appliances such as washing machines and dishwashers as well as other electronic equipment. And don’t forget outdoors. Garden terrace heaters and lighting plus the pond pump are all significant ‘energy thieves’. The actual consumption of all is easy to measure and see (and therefore save) via compact meters in the home.

Many opportunities in commercial properties

Commercial properties naturally feature a wealth of objects to measure, including many of the items found in everyday homes. But engineers are now exploring ways to get modern, large-scale buildings to produce energy as well as consume it. Elevator cars, for example, generate energy when they descend or brake and this can be returned to the building’s power grid as electricity for lighting or heating.
Imported and exported measurement data is usually collected by the meter, and fed to a Facility Management System for analysis.

Industry shares similar needs

In addition to normal units for heating, lighting, ventilation and office administration, industrial premises contain usually processing machinery, conveyers, transport systems, and a great deal of electrical protection devices. Object consumption data measured by meters can be fed to Energy Management Systems for analysis to see how energy costs can be cut.



Object metering is used to show the electricity consumption where it occurs

Joint residential sourcing

Direct and indirect savings plus a boost for the environment

Unlike applications where a separate billing meter is installed in every apartment or residence for individual billing, joint residential sourcing involves having one central 'billing' meter.

The housing association, condominium or equivalent then acts as a single electricity subscriber and redistributes its costs amongst its members according to their actual consumption. The latter is measured by a simple DIN-meter (or additional billing meter) in each apartment. This is often referred to as sub-metering.

The attractions are many. Direct savings are won via reduced network charges, i.e. electricity is supplied to just one subscriber (the association) instead of a subscriber in every apartment. The association then has a much better bargaining position when negotiating prices with energy companies, which should lead to lower prices for all.

Reliable and easy to implement

Joint residential sourcing is easy to implement. Usually no formal approval is required, but this may vary from country to country depending on local rules and legislation. ABB electricity meters help alleviate common concerns as they are approved for billing applications within the EU/EEC, i.e. they are MID-approved (see page 46). Members can thus trust their use in joint residential sourcing.

Simple installation in standard enclosures

The DIN meters usually used to distribute costs between apartments are simple to install. Small enough to fit in standard DIN enclosures, they require no special housing or rebuilding work. The data they generate are normally collected by via pulse or serial readings transmitted continuously to a central unit (the latter also allow access to additional data). At the simplest level, the meters can be read manually.

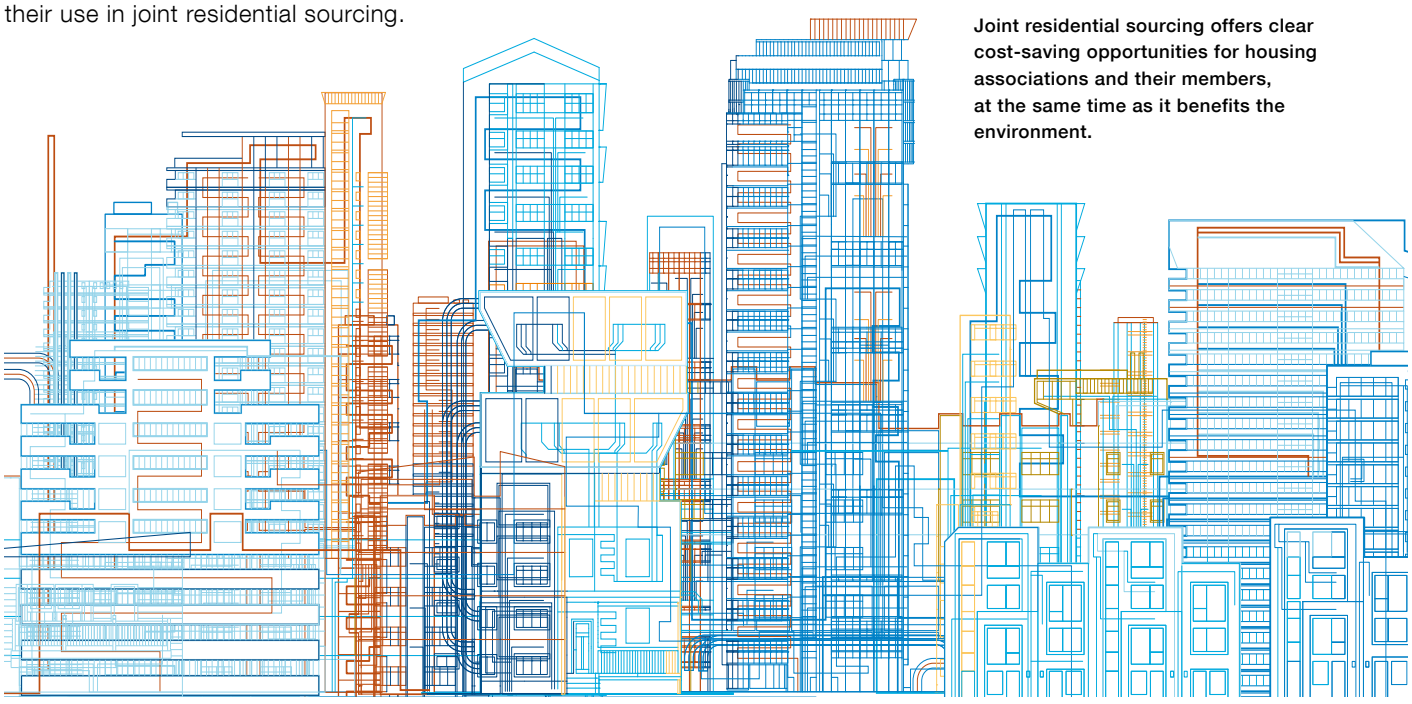
Sub-metering brings on energy awareness

Experience shows that occupiers save up to 30% on electricity bills when they can see their own consumption. This is not surprising. When individual occupiers get a clear picture that relates electricity use to activity, they know exactly where savings can be made.

Cost savings also benefit the environment

Knowing how and where electricity costs arise will also help improve the environment by cutting the need for 'unnecessary' electrical energy production. A specific example is the multitude of devices with 'stand-by' consumption, i.e. connected to the mains supply but not in use. These include transformers for mobile phone chargers, TVs and computers, halogen lamps, etc.

It's not uncommon that such devices in a single home continuously consume up to 100 W or more. This is wasteful and costly. Once again, individual measurement with continuous readings (especially if they are web-based) makes the problem visible – and easier to remedy.



Joint residential sourcing offers clear cost-saving opportunities for housing associations and their members, at the same time as it benefits the environment.

Billing applications

ABB meters meet key regulatory and practical demands for billing applications. Billing employs electricity meters to measure consumption and use this reading to generate an invoice, usually monthly, paid by the user to the energy supplier for the electricity consumed. For this reason, it is also known as revenue metering.

Those who pay bills, usually home-owners or businesses, naturally only want to pay for the electricity they use. ABB meters go a long way to achieving this accurately.

Special requirements on billing meters include MID-approval

Meters that read electricity consumption as a basis for billing must meet special requirements, including compliance with MID, the new EU/EEC directive for measuring instruments that was taken into national legislation during 2006 (see page 46 for more details). In Russia, the equivalent standard is GOST.

For purely practical reasons, billing meter size is also very important. ABB meters are more compact than traditional incoming 'utility meters', which means that they are much easier to install. That they can be enclosed in standard DIN-rail fittings also means an attractive installation, which is important when this is visible in the home, e.g. in an entrance hall.

Modern technical functions increase usability

ABB electricity meters are well equipped to meet modern technical demands such as four quadrant metering, a function increasingly being requested. Four quadrant metering measures energy generated as well as consumed, and is thus highly relevant for properties with their own solar panels or wind power, for example.

Tariffs are used for recording consumption in various time intervals. Tariffs can be controlled via inputs, communication or an internal clock. ABB meters are available with 2 or 4 tariffs.

Previous values and load profile are two further practical features found on certain meters in the ABB range. The former means that the meters save previous consumption readings (usually monthly, sometimes 24-hour) in a register. This allows the electricity supply company to read the exact consumption over a number of previous specified periods.

Load profile measures current electricity consumption over defined intervals, e.g. 15 min, 30 min or 60 min. Subscribers with a web portal can then follow their own use of electricity 'minute-by-minute', which is invaluable for optimizing their use as well as identifying stand-by consumption, i.e. when 'nothing' is on. Both help change energy awareness and consumption behavior for the better!

Finally, ABB meters feature quality and event log, which helps electricity companies log over-tension and undertension voltage plus breaks in supply.

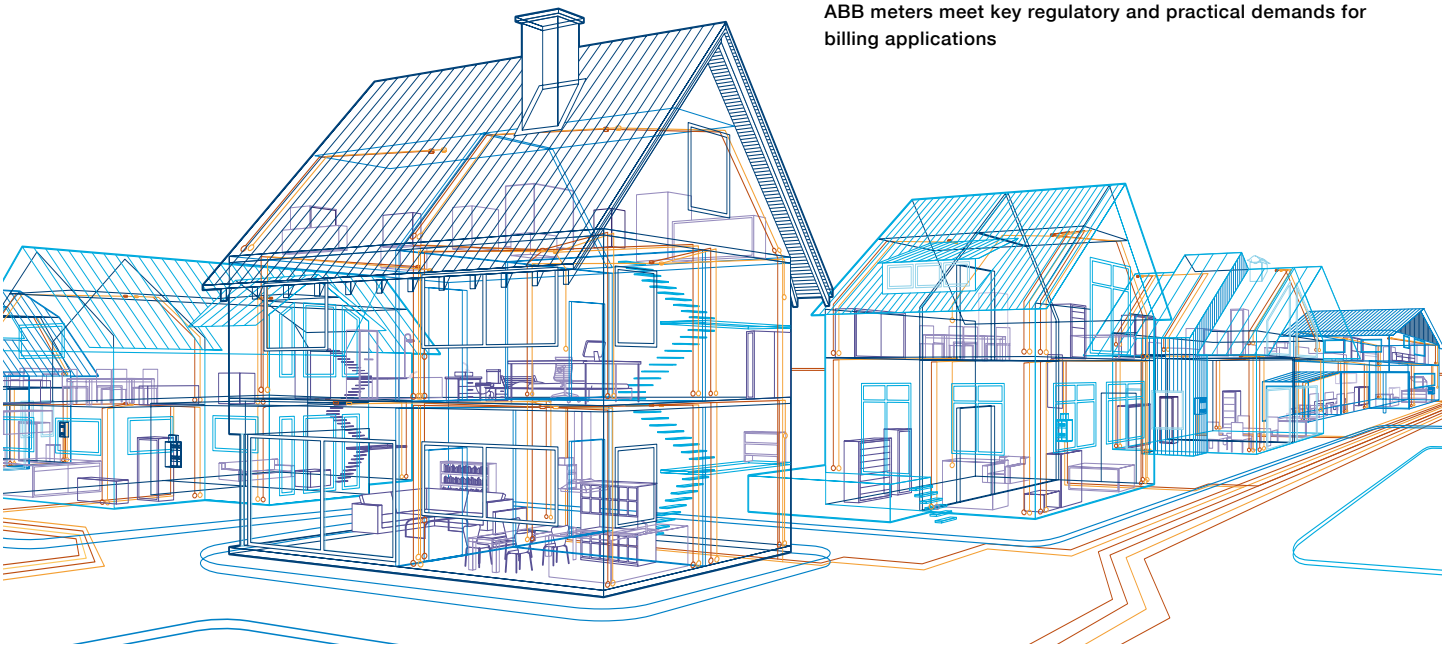
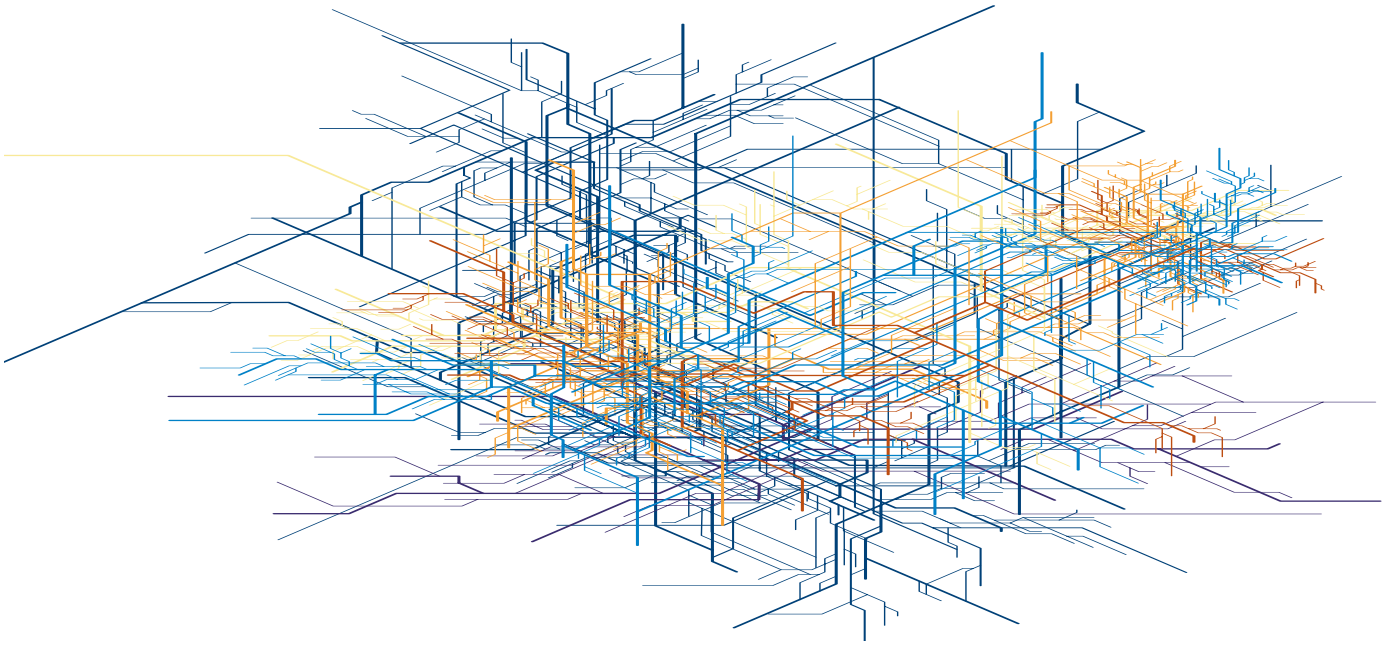


ABB meters meet key regulatory and practical demands for billing applications

Communication



Communication is getting more important every day. Computers and telecommunications drive the development of both technology and infrastructure for communication. Communication is widely used in modern metering applications.

Increasing demands on integration of meter data

Not long ago, meters were considered to be stand alone products, read manually a few times per year. This is not true anymore. Today, there is a high demand of integration of meter data into metering data systems for evaluation and for control of processes. There are strong requirements on connecting actions, e.g. start of equipment etc, to its consequences, an increase of energy consumption. It is only by linking these actions and consequences that we will get tools that are powerful enough for increasing the energy efficiency and changing behavior of the users.

New technologies

Communication is developing with new technologies evolving all the time. New affordable equipment builds up the infrastructure, whether it is within the internet, telecom or other. Metering data is nowadays frequently communicated via LANs and cell phone networks.

Open standards

Open standards are important to communication. Through open standards, equipment from various suppliers can work together and safe solutions be implemented.

Flexible ABB solution

ABB has adopted a flexible solution for communication enabling all their electricity meters. A serial communication adapter can be connected to any ABB meter through an infrared interface on the side of both the meter and the adapter. This solution enables any ABB meter to be connected to a metering system and it is easy to change or upgrade the communication without affecting the installation of the meter itself. Further, a change of the communication adapter does not effect the approval of the meter.

Selection table

Network Type	Max current Direct Connection	Max current CTVT Connection	Voltage	Active energy	Reactive engergy
ODINsingle					
Single phase + N	65	-	1 x 220-240 V	Yes	No
Single phase + N	65	-	1 x 220-240 V	Yes	No
DELTAsingle					
Single phase + N	80	-	1 x 220-240 V	Yes	No
Single phase + N	80	-	1 x 220-240 V	Yes	No
Single phase + N	80	-	1 x 220-240 V	Yes	No
Single phase + N	80	-	1 x 220-240 V	Yes	No
ODIN					
3 phase + N	65	-	3 x 230/400 V	Yes	No
3 phase + N	-	10	3 x 230/400 V	Yes	No
DELTAplus					
Single phase + N	-	6	1 x 57-288 V	Yes	No
Single Phase + N	80	-	1 x 57-288 V	Yes	No
Single Phase + N	80	-	1 x 57-288 V	Yes	No
3 phase	-	6	3 x 100-500 V	Yes	No
3 phase	-	6	3 x 100-500 V	Yes	No
3 phase	-	6	3 x 100-500 V	Yes	No
3 phase	80	-	3 x 100-500 V	Yes	No
3 phase	80	-	3 x 100-500 V	Yes	No
3 phase	-	6	3 x 100-500 V	Yes	Yes
3 phase	80	-	3 x 100-500 V	Yes	Yes
3 phase + N	-	6	3 x 57-288/100-500 V	Yes	No
3 phase + N	-	6	3 x 57-288/100-500 V	Yes	No
3 phase + N	-	6	3 x 57-288/100-500 V	Yes	No
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	No
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	No
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	No
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	No
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	No
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	No
3 phase + N	-	6	3 x 57-288/100-500 V	Yes	Yes
3 phase + N	-	6	3 x 57-288/100-500 V	Yes	Yes
3 phase + N	-	6	3 x 57-288/100-500 V	Yes	Yes
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	Yes
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	Yes
3 phase + N	80	-	3 x 57-288/100-500 V	Yes	Yes
DELTAmax					
3 phase	-	6	3x100-500V	Yes	No
3 phase	-	6	3x100-500V	Yes	Yes
3 phase	80	-	3x100-500V	Yes	Yes
3 phase + N	-	6	3x57-288/100-500V	Yes	No
3 phase + N	-	6	3x57-288/100-500V	Yes	No
3 phase + N	-	6	3x57-288/100-500V	Yes	No
3 phase + N	80	-	3x57-288/100-500V	Yes	No
3 phase + N	80	-	3x57-288/100-500V	Yes	No
3 phase + N	-	6	3x57-288/100-500V	Yes	Yes
3 phase + N	-	6	3x57-288/100-500V	Yes	Yes
3 phase + N	80	-	3x57-288/100-500V	Yes	Yes
3 phase + N	80	-	3x57-288/100-500V	Yes	Yes

Built in comm.	Internal Clock	Instrument Values	Accuracy Class	Tariffs	Pulse output	Type	Ref page No.
IR	No	No	Class B (Cl. 1)	-	No	OD1065	14
IR	No	No	Class B (Cl. 1)	-	Yes	OD1365	14
IR	No	No	Class B (Cl. 1)	-	Yes	FBB 11200	18
IR	Yes *	No	Class B (Cl. 1)	2	Yes	FBB 11205	18
IR	Yes *	No	Class B (Cl. 1)	4	Yes	FBB 11206	18
IR	No	No	Class B (Cl. 1)	-	No	FBU 11200	18
IR	No	No	Class A (Cl. 2)	-	Yes	OD4110	22
IR	No	No	Class A (Cl. 2)	-	Yes	OD4165	22
IR	No	Yes	Class B (Cl. 1)	-	Yes	DAB 11000	26
IR	No	Yes	Class B (Cl. 1)	-	Yes	DBB 11000	27
IR	No	Yes	Class A (Cl. 2)	-	Yes	DBB 21000	27
IR	No	Yes	Class B (Cl. 1)	-	Yes	DAB 12000	28
IR+LonWorks FTT-10A	No	Yes	Class B (Cl. 1)	-	Yes	DAL 12070	28
IR+M-Bus over Twisted pair	No	Yes	Class B (Cl. 1)	-	Yes	DAM 12070	28
IR	No	Yes	Class B (Cl. 1)	-	Yes	DBB 12000	30
IR	No	Yes	Class A (Cl. 2)	-	Yes	DBB 22000	30
IR+M-Bus over Twisted pair	No	Yes	Class B (Cl. 1)	-	Yes	DCM 12070	29
IR+M-Bus over Twisted pair	No	Yes	Class B (Cl. 1)	-	No	DDM 12000	31
IR	No	Yes	Class B (Cl. 1)	-	Yes	DAB 13000	28
IR+LonWorks FTT-10A	No	Yes	Class B (Cl. 1)	-	Yes	DAL 13070	28
IR+M-Bus over Twisted pair	No	Yes	Class B (Cl. 1)	-	Yes	DAM 13070	28
IR	No	Yes	Class B (Cl. 1)	-	Yes	DBB 13000	30
IR	No	Yes	Class A (Cl. 2)	-	Yes	DBB 23000	30
IR+LonWorks FTT-10A	No	Yes	Class B (Cl. 1)	-	No	DBL 13000	30
IR+LonWorks FTT-10A	No	Yes	Class A (Cl. 2)	-	Yes	DBL 23070	30
IR+M-Bus over Twisted pair	No	Yes	Class B (Cl. 1)	-	No	DBM 13000	30
IR+M-Bus over Twisted pair	No	Yes	Class A (Cl. 2)	-	Yes	DBM 23070	30
IR	No	Yes	Class B (Cl. 1)	-	Yes	DCB 13000	29
IR+LonWorks FTT-10A	No	Yes	Class B (Cl. 1)	-	Yes	DCL 13070	29
IR+M-Bus over Twisted pair	No	Yes	Class B (Cl. 1)	-	Yes	DCM 13070	29
IR	No	Yes	Class B (Cl. 1)	-	Yes	DDB 13000	31
IR+LonWorks FTT-10A	No	Yes	Class A (Cl. 2)	-	No	DDL 23000	31
IR+M-Bus over Twisted pair	No	Yes	Class B (Cl. 1)	-	No	DDM 13000	31
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	-	No	DEM 12007	37
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	-	No	DGM 12007	38
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	-	No	DHM 12007	38
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	2	No	DEM 13005	37
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	4	No	DEM 13006	37
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	-	No	DEM 13007	37
IR	Yes	Yes	Class B (Cl. 1)	-	Yes	DFB 13007	37
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	-	No	DFM 13007	37
IR	Yes	Yes	Class B (Cl. 1)	-	Yes	DGB 13007	38
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	-	No	DGM 13007	38
IR	Yes	Yes	Class B (Cl. 1)	-	Yes	DHB 13007	38
IR+M-Bus over Twisted pair	Yes	Yes	Class B (Cl. 1)	-	No	DHM 13007	38

* Internal Clock for tariff control and monthly energy values.

ODINsingle
Product brief

Key applications
- Applications in Commercial buildings
- Application in Industry
- Object metering

Meter performance
- Single phase
- Direct connected up to 65 A
- Active energy
- Accuracy class B (Cl .1)
- Backlit LCD with 6 digits (6 mm digits)
- Low power consumption
- Resettable counter

Communication
- Pulse output
- IR port for Serial Communication Adapter

Installation
- 2 DIN modules width
- Wide temperature range

Approvals
- MID type approval “annex B”
- MID initial verification “annex D”
- IEC type approval

ODINsingle
Description

The ODINsingle is a compact meter for installation in single phase networks. The meter is mounted on a DIN rail and is suitable for installation in distribution boards and small enclosures such as consumer units. The meter is available in two versions, one with pulse output and resettable register and one without. Both these versions measures active energy. The product is configuration free which makes it very easy to deal with in all applications.

General features

ODINsingle is a meter that is very easy to handle. It is easy to read the large LCD display with 6 mm high digits and symbols for load indication and communication. The meter has a LED on the front that flashes proportionally to the measured energy. The energy consumption of the meter is low, less than 1.0 VA.

Communication

Data from ODINsingle is collected via pulse output or serial communication. The pulse output generates pulses proportionally to the measured energy. ODIN comes with an infrared port for communication with an external Serial Communication Adapter (SCA). There are SCAs for M-Bus, RS-232, Ethernet, GSM/GPRS and KNX (See Communication adapters, page 42).

Configuration

There is no configuration needed for ODINsingle. On versions with resettable register, there is a push button for resetting this register on the front of the meter. This button is covered when the meter is installed in an enclosure. It can also be sealed by an optional cover.

Installation

All terminals are clearly marked. A load indicator is displayed on the LCD for easy verification of the installation. ODINsingle is also prepared for busbar installation.

Approval

ODINsingle is type approved according to IEC and it is both type approved and verified according to MID. MID is the Measuring Instruments Directive 2004/22/EC from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA.

The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.

ODINsingle
Ordering data, Wiring diagrams

Active import measurement, Direct connected, 1 phase, Class B (CI. 1), Verified and approved according MID, IEC approval

Direct connected electricity meter

1 phase meter 65A, Class B (CI. 1)

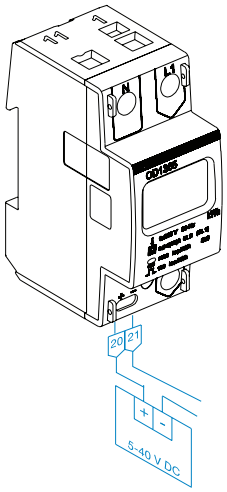
Order code	Type	Voltage (V)	IR port	Pulse output	Weight kg
2CMA131040R1000	OD1065	1 x 220-240 V	Yes	No	0.135

Direct connected electricity meter

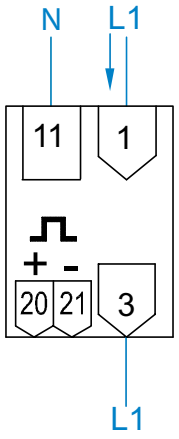
1 phase meter 65A, Class B (CI. 1), Resettable register

Order code	Type	Voltage (V)	IR port	Pulse output	Weight kg
2CMA131041R1000	OD1365	1 x 220-240 V	Yes	Yes	0.140

Pulse output



Direct connection



ODINsingle
Technical data

Single phase meter, direct connection up to 65A		Types OD 1065 and OD 1365
Voltage (V)	Nominal voltage AC Voltage range	1 x 220 - 240 -20% to +15% of nominal voltage
Current (A)	I^{min} I^{tr} I^{ref} (I^{b}) I^{n} I^{max} I^{st}	0.25 0.5 5 - 65 20 mA
General data	Frequency (Hz) Frequency range Accuracy Class Power consumption current circuits at 230 VAC and I_{ref} Power consumption voltage curcuits	50/60 ± 5% B (Cl. 1) 0.004 VA, 0.004 W 1.0 VA, 1.0 W
Standards	MID approval according to International approlval according to	EN 50470-1, EN 50470-3 IEC 62052-11, IEC 62053-21
Memory back-up		EEprom
Clock back-up		N/A
Clock accuracy		N/A
Temperature range (°C)	Operating	-25 to +55
	Storage	-25 to +70
Transformer ratio	Voltage transformer ratio Current transformer ratio Max transformer ratio	N/A N/A N/A
Enclosure material	Upper Lower	Polycarbonate Glassfibre reinforced polycarbonate
Environment	Mechanical environment Electromagnetical environment Resistance to heat and fire Humidity	M1 E2 According to IEC 60695-2-10, IEC 60695-2-11: Terminal 960°C, Cover 650°C 75% yearly average, 95% on 30 days/year
Connection area main terminals	Current terminals 1 x mm^2 Voltage terminals 1 x mm^2	1 - 16 N/A
Protection against penetration of dust and water	According to IEC 60529	IP 20 on terminal block without protective enclosure *)
Pulse output (only OD 1365)	Connection area, main terminals, - 1 x mm^2 External pulse voltage - Voltage (V) DC - Voltage (V) AC/DC Max. current (mA) Pulse length (ms) Pulse frequency (imp/kWh) Standard	0 - 2.5 5 - 40 (Transistor output) N/A 100 100 (± 2.5) 100 IEC 62053-31 (SO)
LED	Pulse frequency (imp/kWh) Pulse length (ms)	1000 40
Display		Backlit LCD with 6 digits, height 6 mm
Electromagnetic compability (EMC)	Impuls voltage test (kV) Fast transient burst test (kV) Radio frequency immunity Electrostatic discharge (ESD) (kV)	6, 1.2 / 50µs (IEC 60060-1, HD 588.1 S1) 4 (IEC 61000-4-4) 80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3) 15 (IEC 61000-4-2)
Tariff inputs (optional)	Max. voltage (V) AC Max. wire size (mm^2) Input voltage range (V) AC	N/A N/A N/A
Terminal wire area (mm^2)	M-Bus LonWorks FTT-10A	N/A N/A
Dimensions	Width (mm) Height (mm) Depth (mm) DIN modules	35.8 85 63.4 2

*) To comply with the protection requirements the meter must be mounted in a class IP 51 enclosure or better, acc to IEC 60529.

DELTAsingle
Product brief

Key applications

- Billing applications
- Applications in Commercial buildings
- Application in industry
- Object metering

Meter performance

- Single phase
- Direct connected up to 80 A
- Active energy
- Accuracy class B (Cl.1)
- LCD with 6 digits (6 mm digits)
- Optional 2 or 4 tariffs
- Built-in clock for tariff control
- Low power consumption

Communication

- Pulse output
- IR port for Serial Communication Adapter

Installation

- 4 DIN modules width
- Terminal according to DIN 43857 (”Utility terminal”)
- Wide temperature range
- Sealable push buttons for configura tion

Approvals

- MID type approval ”annex B”
- MID initial verification ”annex D”
- IEC type approval

DELTAsingle
Description

The DELTAsingle is a single phase meter for installation on a DIN rail in distribution boards and small enclosures such as consumer units. The meter measures active energy. The product supports a wide temperature range which makes it suitable for installation in many applications.

General features

DELTAsingle is easy to handle. It is easy to read the large LCD display with 6 mm high digits and symbols for load indication etc. The meter has LED on the front that flashes proportionally to the measured energy. The energy consumption of the meter is low, less than 1.3 VA.

Communication

Data from DELTAsingle is collected via pulse output or serial communication. The pulse output generates pulses proportionally to the measured energy. All DELTAsingle meters come with an infrared port for communication with an external Serial Communication Adapter (SCA). There are SCAs for M-Bus, RS-232, Ethernet, GSM/GPRS and KNX.

Tariffs

The DELTAsingle range includes meters for 2 and 4 tariffs. The tariffs are controlled via an internal clock.

Configuration

The configuration of DELTAsingle is simple. The two buttons scroll and set are used to configure date, time and M-Bus primary address. The set button is under a sealable cover.

Installation

All terminals are clearly marked. A load indicator is displayed on the LCD for easy verification of the installation.

Approval

DELTAsingle is type approved according to IEC and both type approved and verified according to MID. MID is the Measuring Instruments Directive 2004/22/EC from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA.

The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.

DELTAsingle
Ordering data, Wiring diagrams

Active import measurement, Direct connected, 1 phase, Class B (Cl. 1), Verified and approved according MID, IEC approval

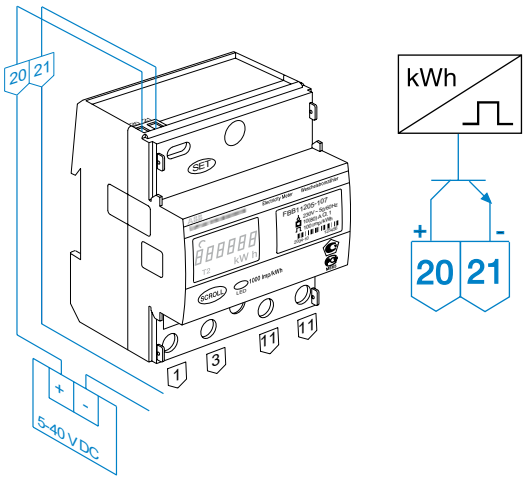
Direct connected electricity meter

1 phase meter 80A, Class B (Cl. 1)

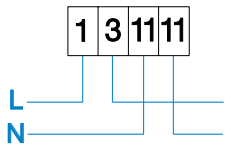
Order code	Type	Voltage (V)	No. of tariffs	IR port	Pulse output	Weight kg
2CMA180892R1000	FBB 11200	1 x 220-240 V	-	Yes	Yes	0.150
2CMA180894R1000	FBB 11205	1 x 220-240 V	2*)	Yes	Yes	0.150
2CMA180896R1000	FBB 11206	1 x 220-240 V	4*)	Yes	Yes	0.150
2CMA180891R1000	FBU 11200	1 x 220-240 V	-	Yes	No	0.150
2CMA180893R1000	FBU 11205	1 x 220-240 V	2*)	Yes	No	0.150
2CMA180895R1000	FBU 11206	1 x 220-240 V	4*)	Yes	No	0.150

*) Controlled by internal clock.

Pulse output



Direct connection



DELTAsingle
Technical data

Single phase meter, direct connection up to 80A		Type FBx
Voltage (V)	Nominal voltage AC Voltage range	1 x 220 - 240 -20% to +15% of norminal voltage
Current (A)	I_{min} I_{tr} I_{ref} (I_b) I_n I_{max} I_{st}	0.5 1.0 10 80 25 mA
General data	Frequency (Hz) Frequency range Accuracy Class Power consumption current circuits at 230 VAC and I_{ref} Power consumption voltage curcuits	50/60 ± 5% B (Cl. 1) 0.02 VA, 0.02 W 1.3 VA, 1.3 W
Standards	MID approval according to International approlval according to	EN 50470-1, EN 50470-3 IEC 62052-11, IEC 62053-21
Memory back-up		EEprom
Clock back-up	Super Cap. typically 168 hours back-up at +20°C, min 48 hours over operating temperature range	
Clock accuracy		IEC 62052-11, IEC 62054-21
Temperature range (°C)	Operating Storage	-40 to +55 -40 to +70
Transformer ratio	Voltage transformer ratio Current transformer ratio Max transformer ratio	N/A N/A N/A
Enclosure material	Upper Lower	Polycarbonate Glassfibre reinforced polycarbonate
Environment	Mechanical environment Electromagnetical environment Resistance to heat and fire Humidity	M1 E2 According to IEC 60695-2-10, IEC 60695-2-11, Terminal 960°C, Cover 650°C 75% yearly average, 95% on 30 days/year
Connection area main terminals	Current terminals 1 x mm^2 Voltage terminals 1 x mm^2	4 - 25 N/A
Protection against penetration of dust and water[1]	According to IEC 60529	IP 20 on terminal block without protective enclosure *
Pulse output	Connection area, main terminals, - 1 x mm^2 External pulse voltage - Voltage (V) DC - Voltage (V) AC/DC Max. current (mA) Pulse length (ms) Pulse frequency (imp/kWh) Standard	0 - 2.5 5 - 40 (Transistor output) N/A 100 100 (± 2.5) 100 IEC 62053-1 (SO)
LED	Pulse frequency (imp/kWh) Pulse length (ms)	1000 40
Display	LCD with 6 digits, height 6 mm	
Electromagnetic compability (EMC)	Impuls voltage test (kV) Fast transient burst test (kV) Radio frequency immunity Electrostatic discharge (ESD) (kV)	6, 1.2 / 50µs (IEC 60060-1, HD 588.1 S1) 4 (IEC 61000-4-4) 80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3) 15 (IEC 61000-4-2)
Tariff inputs (optional)	Max. voltage (V) AC Max. wire size (mm^2) Input voltage range (V) AC	N/A N/A N/A
Terminal wire area (mm^2)	M-Bus LonWorks FTT-10A	N/A N/A
Dimensions	Width (mm) Height (mm) Depth (mm) DIN modules	72 95 63.6 4

*) To comply with the protection requirements the meter must be mounted in a class IP 51 enclosure or better, acc to IEC 60529.

ODIN
Product brief

Key applications
- Applications in Commercial buildings
- Object metering

Meter performance
- 3 phase
- Direct connected up to 65 A
- Transformer connected 5 A
- Active energy
- Accuracy class A (Cl. 2)
- LCD with 7 digits (6 mm digits)
- Low power consumption

Communication
- Pulse output
- IR port for Serial Communication Adapter

Installation
- 6 DIN modules width
- Wide temperature range
- Easy configuration of transformer ratio

Approvals
- MID type approval “annex B”
- MID initial verification “annex D”
- IEC type approval

ODIN
Description

The ODIN is a basic meter for installation in three phase 4-wire networks. The meter is mounted on a DIN rail and is suitable for installation in distribution boards and small encloses such as consumer units. The meter is available in two versions, one direct connected and one transformer connected. Both these versions measures active energy. The product is configuration free (except for the setting of transformer ratio on OD 4110) which makes it very easy to deal with in all applications.

General features

ODIN is a meter that is very easy to handle. It is easy to read the large LCD display with 6 mm high digits and symbols for load indication, voltages etc. The meter has a LED on the front that flashes proportionally to the measured energy. The energy consumption of the meter is low, less than 0.9 VA per phase.

Communication

Data from ODIN is collected via pulse output or serial communication. The pulse output generates pulses proportionally to the measured energy. ODIN comes with an infrared port for communication with an external Serial Communication Adapter (SCA). There are SCAs for M-Bus, RS-232, Ethernet, GSM/GPRS and KNX (See Communication adapters, page 42).

Configuration

There is no configuration for the direct connected version of ODIN. For the transformer connected version, the only configuration needed is the setting of the transformer ratio. This is easily done via one push button where the appropriate setting is selected. This configuration button is sealed when the meter is installed in a sealable DIN rail enclosure or when a cover (see accessories, page 21) is mounted.

Installation

ODIN features an installation diagram on the front of the meter. This makes it very easy to install. All terminals are clearly marked. A load indicator and voltage indication is displayed on the LCD for easy verification of the installation. ODIN is also prepared for busbar installation.

Approval

ODIN is type approved according to IEC and it is both type approved and verified according to MID. MID is the Measuring Instruments Directive 2004/22/EC from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA.

ODIN
Ordering data, Wiring diagrams

Active import measurement, 3 phase, Class A (Cl. 2), IEC approval

Direct connected electricity meter

3 phase meter 65A, Class A (Cl. 2)

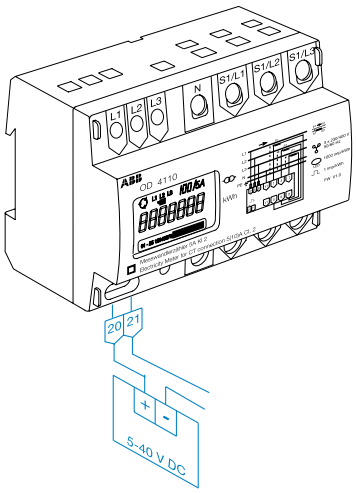
Order code	Type	Voltage (V)	No. of tariffs	IR port	Pulse output	Weight kg
2CMA131024R1000	OD4165	3 x 230/400 V	-	Yes	Yes	0.393

CTVT connected electricity meter

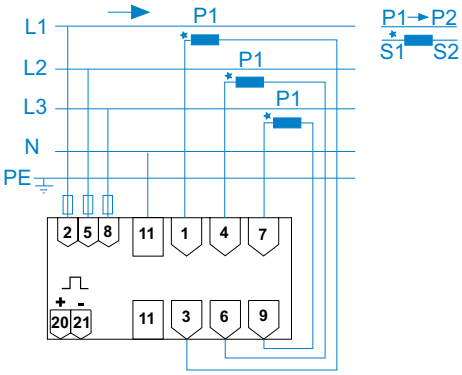
3 phase meter 10A, Class A (Cl. 2)

Order code	Type	Voltage (V)	No. of tariffs	IR port	Pulse output	Weight kg
2CMA131025R1000	OD4110	3 x 230/400 V	-	Yes	Yes	0.417

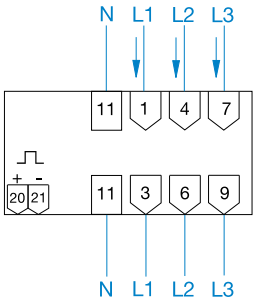
Pulse output



Connection via current transformer



Direct connection



ODIN
Technical data

Three phase meter, direct connection up to 65A		Type OD4165	Type OD4110
Voltage (V)	Nominal voltage AC Voltage range	3 x 230/400 -20% to +15% of norminal voltage	
Current (A)	I_{min} I_{tr} I_{ref} (I_b) I_n I_{max} I_{st}	0.25 0.50 5 - 65 25 mA	0.10 0.25 - 5 10 15 mA
General data	Frequency (Hz) Frequency range Accuracy Class Power consumption current circuits at 230 VAC and I_{ref} Power consumption voltage curcuits	50/60 ± 5% A (Cl. 2) 0.004 VA, 0.004 W per phase 0.9 VA, 0.9 W per phase	
Standards	MID approval according to International approlval according to	EN 50470-1, EN 50470-3 IEC 62052-11, IEC 62053-21	
Memory back-up		EEprom	
Clock back-up		N/A	
Clock accuracy		N/A	
Temperature range (°C)	Operating Storage	-25 to +55 -25 to +70	
Transformer ratio	Voltage transformer ratio Current transformer ratio	N/A N/A	N/A 5/5, 75/5, 100/5, 150/5, 200/5, 250/5, 300/5,400/5, 500/5, 600/5, 700/5, 800/5, 900/5 A/A
Enclosure material	Upper Lower	Polycarbonate Glassfibre reinforced polycarbonate	
Environment	Mechanical environment Electromagnetical environment Resistance to heat and fire Humidity	M1 E2 According to IEC 60695-2-10, IEC 60695-2-11: Terminal 960°C, Cover 650°C 75% yearly average, 95% on 30 days/year	
Connection area main terminals	Current terminals 1 x mm^2 Voltage terminals 1 x mm^2	1 - 16 N/A	1 - 16 0.5 - 6
Protection against penetration of dust and water	According to IEC 60529	IP 20 on terminal block without protective enclosure *)	
Pulse output	Connection area, main terminals, - 1 x mm^2 External pulse voltage: - Voltage (V) DC - Voltage (V) AC/DC Max. current (mA) Pulse length (ms) Pulse frequency (imp/kWh) Standard	0 - 2.5 5 - 40 (transistor output) N/A 100 100 (± 2.5) 100 IEC 62053-31 (SO)	0 - 2.5 5 - 40 (transistor output) N/A 100 100 (± 2.5) 10 IEC 62053-31 (SO)
LED	Pulse frequency (imp/kWh) Pulse length (ms)	100 40	1000 40
Display		LCD with 7 digits, height 6 mm	
Electromagnetic compability (EMC)	Impuls voltage test (kV) Fast transient burst test (kV) Radio frequency immunity Electrostatic discharge (ESD) (kV)	6, 1.2 / 50µs (IEC 60060-1, HD 588.1 S1) 4 (IEC 61000-4-4) 80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3) 15 (IEC 61000-4-2)	
Tariff inputs (optional)	Max. voltage (V) AC Max. wire size (mm^2) Input voltage range (V) AC	N/A N/A N/A	
Terminal wire area (mm^2)	M-Bus LonWorks FTT-10A	N/A N/A	
Dimensions	Width (mm) Height (mm) Depth (mm) DIN modules	105 85 63.4 6	

*) To comply with the protection requirements the meter must be mounted in a class IP 51 enclosure or better, acc to IEC 60529.

DELTAplus
Product brief

Key applications
- Billing applications
- Applications in Commercial buildings
- Application in Industry
- Object metering

Meter performance
- 3 phase and single phase
- Direct connected up to 80 A
- Transformer connected 1, 2 or 5 A
- Active or active and reactive energy
- Accuracy class B or A (Cl .1 or Cl. 2)
- Wide voltage range (100 – 500 V AC)
- LCD with 7 digits (7 mm digits)
- Optional 2 or 4 tariffs
- Tariff control via inputs or communication
- Very low power consumption

Communication
- Pulse output
- Built-in M-Bus or LonWorks FTT 10-A interfaces
- IR port for Serial Communication Adapter

Installation
- 7 DIN modules width
- Terminal according to DIN 43857 (“Utility terminal”)
- Automatic installation check
- Extra wide temperature range
- Sealable push buttons for configuration
- Scroll eye for safe browsing of data and settings

Approvals
- MID type approval “annex B”
- MID initial verification “annex D”
- IEC type approval

DELTAplus
Description

The DELTAplus is an advanced meter for installation in three phase and single phase networks. The meter is mounted on a DIN rail and is suitable for installation in distribution boards and small encloses such as consumer units. The meter measures active or combined (active and reactive) energy. The product supports a wide voltage range and a wide temperature range which makes it suitable for installation in many applications.

General features

DELTAplus is an meter that is easy to handle. It is easy to read the large LCD display with 7 mm high digits and symbols for load indication, errors etc. The meter has LED on the front that flashes proportionally to the measured energy. The energy consumption of the meter is very low, less than 0.6 VA.

Communication

Data from DELTAplus is collected via pulse output or serial communication. The pulse output is a polarity independent solid state relay that generates pulses proportionally to the measured energy. DELTAplus can be equipped with built-in communication interfaces for M-Bus or LonWorks FTT-10A. All DELTAplus meters come with an infrared port for communication with an external Serial Communication Adapter (SCA). There are SCAs for M-Bus, RS-232, Ethernet, GSM/GPRS and KNX.

Tariffs

The DELTAplus range includes meters for 2 and 4 tariffs. The tariffs are controlled via inputs or via communication.

Instrumentation

Through the instrumentation functionality of DELTAplus, the following electrical properties can be read

- Active power (per phase and total)
- Apparent power (per phase and total)
- Reactive power (per phase and total)
- Current (per phase)
- Voltage (per phase)
- Frequency
- Power factor

Inputs and outputs

DELTAplus support two I/O's. It can be two inputs or two outputs or one of each. Outputs can be used for controlling external apparatus like a contactor or an alarm (max 120 mA). Inputs can be used for counting pulses from e.g. a water meter, or for reading status from external devices.

Configuration

The configuration of DELTAplus is simple. Using the two buttons scroll and set you can configure transformer ratio, pulse frequency, M-Bus address and baud rate when applicable. The two push buttons are under a sealable cover. When they are sealed, the scroll eye on the fron of the meter can be used for reading the parameters and also instrument values.

Installation

DELTAplus comes with an automatic installation check that indicates problems in the installation.

Approval

DELTAplus is type approved according to IEC and it is both type approved and verified according to MID. MID is the Measuring Instruments Directive 2004/22/EC from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA.

The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.

DELTAplus
Ordering data

Active import measurement, 1 phase, Class B (Cl.1), Verified and approved according MID, IEC approval

CTVT connected electricity meter

1 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA180819R1000	DAB 11000	1 x 57-288 V	B (Cl. 1)	-	Yes	Yes	0.291
2CMA139006R1000	DAB 11001	1 x 57-288 V	B (Cl. 1)	2[1)]	Yes	Yes	0.305
2CMA139464R1000	DAB 11002	1 x 57-288 V	B (Cl. 1)	4[2)]	Yes	Yes	0.305

CTVT connected electricity meter, LonWorks FTT-10A

1 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA180827R1000	DAL 11070	1 x 57-288 V	B (Cl. 1)	-	Yes	Yes	0.312

CTVT connected electricity meter, M-Bus over Twisted pair

1 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139255R1000	DAM 11000	1 x 57-288 V	B (Cl. 1)	-	Yes	No	0.298

Active and reactive import measurement, 1 phase, Class B (Cl.1), Verified and approved according MID, IEC approval

CTVT connected electricity meter

1 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139389R1000	DCB 11000	1 x 57-288 V	B (Cl. 1)	-	Yes	Yes	0.291

[1)] Controlled by 1 input
[2)] Controlled by 2 inputs

DELTAplus
Ordering data

Active import measurement, 1 phase, Class B or A (Cl. 1 or Cl. 2), Verified and approved according MID, IEC approval

Direct connected electricity meter

1 phase meter 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA180805R1000	DBB 11000	1 x 57-288 V	B (Cl. 1)	-	Yes	Yes	0.308
2CMA180818R1000	DBB 11001	1 x 57-288 V	B (Cl. 1)	2[1)]	Yes	Yes	0.322
2CMA180804R1000	DBB 21000	1 x 57-288 V	A (Cl. 2	-	Yes	Yes	0.308
2CMA180816R1000	DBB 21001	1 x 57-288 V	A (Cl. 2	2[1)]	Yes	Yes	0.322
2CMA180817R1000	DBB 21002	1 x 57-288 V	A (Cl. 2	4[2)]	Yes	Yes	0.322

Direct connected electricity meter, LonWorks FTT-10A

1 phase meter 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Option	Weight kg
2CMA139390R1000	DBL 11010	1 x 57-288 V	B (Cl. 1)	-	Yes	No	1 input (40 V)	0.332
2CMA180833R1000	DBL 21000	1 x 57-288 V	A (Cl. 2	-	Yes	No	-	0.318

Direct connected electricity meter, M-Bus over Twisted pair

1 phase meter 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139386R1000	DBM 11000	1 x 57-288 V	B (Cl. 1)	-	Yes	No	0.315
2CMA139373R1000	DBM 11070	1 x 57-288 V	B (Cl. 1)	-	Yes	Yes	0.329
2CMA180843R1000	DBM 21000	1 x 57-288 V	A (Cl. 2)	-	Yes	No	0.315

Active and reactive import measurement, 1 phase, Class B (Cl. 1), Verified and approved according MID, IEC approval

Direct connected electricity meter

1 phase meter 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139454R1000	DDB 11001	1 x 57-288 V	B (Cl. 1	2[1)]	Yes	Yes	0.329

[1)] Controlled by 1 input
[2)] Controlled by 2 inputs

DELTAplus
Ordering data

Active import measurement, 3 phase, Class B (Cl. 1), Verified and approved according MID, IEC approval

CTVT connected electricity meter

3 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No of tariffs	IR port	Pulse output	Option	Weight kg
2CMA180807R1000	DAB 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	Yes	-	0.311
2CMA139366R1000	DAB 12001	3 x 100-500 V	B (Cl. 1)	2[1)]	Yes	Yes	-	0.325
2CMA180806R1000	DAB 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	-	0.331
2CMA180870R1000	DAB 13001	3 x 57-288/100-500 V	B (Cl. 1)	2[1)]	Yes	Yes	-	0.345
2CMA180871R1000	DAB 13002	3 x 57-288/100-500 V	B (Cl. 1)	4[2)]	Yes	Yes	-	0.345
2CMA139460R1000	DAB 13004	3 x 57-288/100-500 V	B (Cl. 1)	4[3)]	Yes	Yes	-	0.331
2CMA139379R1000	DAB 13050	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	1 in/1out (230 V)	0.345

CTVT connected electricity meter, LonWorks FTT-10A

3 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No of tariffs	IR port	Pulse output	Option	Weight kg
2CMA180825R1000	DAL 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	No	-	0.321
2CMA180826R1000	DAL 12070	3 x 100-500 V	B (Cl. 1)	-	Yes	No	-	0.335
2CMA180823R1000	DAL 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	-	0.341
2CMA139263R1000	DAL 13001	3 x 57-288/100-500 V	B (Cl. 1)	2[1)]	Yes	No	-	0.355
2CMA180834R1000	DAL 13003	3 x 57-288/100-500 V	B (Cl. 1)	2[3)]	Yes	No	-	0.341
2CMA180835R1000	DAL 13004	3 x 57-288/100-500 V	B (Cl. 1)	4[3)]	Yes	No	-	0.341
2CMA139104R1000	DAL 13010	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	1 input (40 V)	0.355
2CMA139376R1000	DAL 13030	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	1 output (230 V)	0.355
2CMA180824R1000	DAL 13070	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	-	0.355

CTVT connected electricity meter, M-Bus over Twisted pair

3 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA180846R1000	DAM 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	No	0.318
2CMA139388R1000	DAM 12070	3 x 100-500 V	B (Cl. 1)	-	Yes	Yes	0.332
2CMA180844R1000	DAM 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	0.338
2CMA180855R1000	DAM 13001	3 x 57-288/100-500 V	B (Cl. 1)	2[1)]	Yes	No	0.352
2CMA180856R1000	DAM 13002	3 x 57-288/100-500 V	B (Cl. 1)	4[2)]	Yes	No	0.352
2CMA139286R1000	DAM 13004	3 x 57-288/100-500 V	B (Cl. 1)	4[3)]	Yes	No	0.338
2CMA180845R1000	DAM 13070	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	0.352

[1)] Controlled by 1 input
[2)] Controlled by 2 inputs
[3)] Controlled by communication commands

DELTAplus
Ordering data

Active and reactive import measurement, 3 phase, Class B Cl. 1), Verified and approved according MID, IEC approval

CTVT connected electricity meter

3 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA180809R1000	DCB 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	Yes	0.311
2CMA139453R1000	DCB 12001	3 x 100-500 V	B (Cl. 1)	2[1)]	Yes	Yes	0.325
2CMA180808R1000	DCB 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	0.331
2CMA180872R1000	DCB 13001	3 x 57-288/100-500 V	B (Cl. 1)	2[1)]	Yes	Yes	0.345
2CMA180873R1000	DCB 13002	3 x 57-288/100-500 V	B (Cl. 1)	4 [2)]	Yes	Yes	0.345

CTVT connected electricity meter, LonWorks FTT-10A

3 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA180836R1000	DCL 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	No	0.321
2CMA139349R1000	DCL 12004	3 x 100-500 V	B (Cl. 1)	4[3)]	Yes	No	0.321
2CMA180828R1000	DCL 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	0.341
2CMA139105R1000	DCL 13001	3 x 57-288/100-500 V	B (Cl. 1)	2[1)]	Yes	No	0.355
2CMA139016R1000	DCL 13003	3 x 57-288/100-500 V	B (Cl. 1)	2[3)]	Yes	No	0.341
2CMA139327R1000	DCL 13070	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	0.355

CTVT connected electricity meter, M-Bus over Twisted pair

3 phase meter 6A

Order code	Type	Voltage (V)	Accuracy Class	No of tariffs	IR port	Pulse output	Option	Weight kg
2CMA180849R1000	DCM 12070	3 x 100-500 V	B (Cl. 1)	-	Yes	Yes	2 output (230 V)	0.332
2CMA180852R1000	DCM 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	-	0.338
2CMA139351R1000	DCM 13001	3 x 57-288/100-500 V	B (Cl. 1)	2[1)]	Yes	No	-	0.352
2CMA180848R1000	DCM 13070	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	2 output (230 V)	0.352

[1)] Controlled by 1 input
[2)] Controlled by 2 inputs
[3)] Controlled by communication commands

DELTAplus
Ordering data

Active import measurement, 3 phase, Class B or A (Cl. 1 or Cl. 2), Verified and approved according MID, IEC approval

Direct connected electricity meter

3 phase meter, 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA180803R1000	DBB 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	Yes	0.350
2CMA180801R1000	DBB 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	0.374
2CMA180812R1000	DBB 13001	3 x 57-288/100-500 V	B (Cl. 1)	2[1)]	Yes	Yes	0.388
2CMA180802R1000	DBB 22000	3 x 100-500 V	A (Cl. 2)	-	Yes	Yes	0.350
2CMA180814R1000	DBB 22001	3 x 100-500 V	A (Cl. 2)	2[1)]	Yes	Yes	0.364
2CMA180815R1000	DBB 22002	3 x 100-500 V	A (Cl. 2)	4[2)]	Yes	Yes	0.364
2CMA180800R1000	DBB 23000	3 x 57-288/100-500 V	A (Cl. 2)	-	Yes	Yes	0.374
2CMA180811R1000	DBB 23001	3 x 57-288/100-500 V	A (Cl. 2)	2[1)]	Yes	Yes	0.388
2CMA180813R1000	DBB 23002	3 x 57-288/100-500 V	A (Cl. 2)	4[2)]	Yes	Yes	0.388
2CMA139461R1000	DBB 23004	3 x 57-288/100-500 V	A (Cl. 2)	4 [3)]	Yes	Yes	0.374

Direct connected electricity meter, LonWorks FTT-10A

3 phase meter 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139378R1000	DBL 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	0.384
2CMA180822R1000	DBL 22000	3 x 100-500 V	A (Cl. 2)	-	Yes	No	0.360
2CMA180831R1000	DBL 22003	3 x 100-500 V	A (Cl. 2)	2 [3)]	Yes	No	0.360
2CMA180832R1000	DBL 22004	3 x 100-500 V	A (Cl. 2)	4 [3)]	Yes	No	0.360
2CMA180820R1000	DBL 23000	3 x 57-288/100-500 V	A (Cl. 2)	-	Yes	No	0.384
2CMA139264R1000	DBL 23001	3 x 57-288/100-500 V	A (Cl. 2)	2 [1)]	Yes	No	0.398
2CMA180829R1000	DBL 23003	3 x 57-288/100-500 V	A (Cl. 2)	2 [3)]	Yes	No	0.384
2CMA180830R1000	DBL 23004	3 x 57-288/100-500 V	A (Cl. 2)	4 [3)]	Yes	No	0.384
2CMA180821R1000	DBL 23070	3 x 57-288/100-500 V	A (Cl. 2)	-	Yes	Yes	0.398

Direct connected electricity meter, M-Bus over Twisted pair

3 phase meter 80A

Order code	Type	Voltage (V)	Accuracy Class	No of tariffs	IR port	Pulse output	Option	Weight kg
2CMA139364R1000	DBM 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	No	-	0.357
2CMA139352R1000	DBM 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	-	0.384
2CMA180842R1000	DBM 22000	3 x 100-500 V	A (Cl. 2)	-	Yes	No	-	0.357
2CMA180923R1000	DBM 22001	3 x 100-500 V	A (Cl. 2)	2 [1)]	Yes	No	-	0.371
2CMA180924R1000	DBM 22002	3 x 100-500 V	A (Cl. 2)	4 [2)]	Yes	No	-	0.371
2CMA180840R1000	DBM 23000	3 x 57-288/100-500 V	A (Cl. 2)	-	Yes	No	-	0.381
2CMA180920R1000	DBM 23001	3 x 57-288/100-500 V	A (Cl. 2)	2 [1)]	Yes	No	-	0.395
2CMA180921R1000	DBM 23002	3 x 57-288/100-500 V	A (Cl. 2)	4 [2)]	Yes	No	-	0.395
2CMA139017R1000	DBM 23003	3 x 57-288/100-500 V	A (Cl. 2)	2 [3)]	Yes	No	-	0.381
2CMA139326R1000	DBM 23004	3 x 57-288/100-500 V	A (Cl. 2)	4 [3)]	Yes	No	-	0.381
2CMA180922R1000	DBM 23020	3 x 57-288/100-500 V	A (Cl. 2)	-	Yes	No	2 inputs (40V)	0.395
2CMA139256R1000	DBM 23050	3 x 57-288/100-500 V	A (Cl. 2)	-	Yes	No	1 in/1out (230 V)	0.395
2CMA180841R1000	DBM 23070	3 x 57-288/100-500 V	A (Cl. 2)	-	Yes	Yes		0.395

[1)] Controlled by 1 input, [2)] Controlled by 2 inputs, [3)] Controlled by communication commands

DELTAplus
Ordering data

Active and reactiv import measurement, 3 phase, Class B or A (Cl. 1 or Cl. 2), Verified and approved according MID, IEC approval

Direct connected electricity meter

3 phase meter, 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139438R1000	DDB 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	Yes	0.350
2CMA139455R1000	DDB 12001	3 x 100-500 V	B (Cl. 1)	2[1)]	Yes	Yes	0.364
2CMA180810R1000	DDB 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	Yes	0.374
2CMA139257R1000	DDB 13002	3 x 57-288/100-500 V	B (Cl. 1)	4[2)]	Yes	Yes	0.388

Direct connected electricity meter, LonWorks FTT-10A

3 phase meter 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139357R1000	DDL 23000	3 x 57-288/100-500 V	A (Cl. 2)	-	Yes	No	0.384

Direct connected electricity meter, M-Bus over Twisted pair

3 phase meter 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139365R1000	DDM 12000	3 x 100-500 V	B (Cl. 1)	-	Yes	No	0.357
2CMA139447R1000	DDM 13000	3 x 57-288/100-500 V	B (Cl. 1)	-	Yes	No	0.381

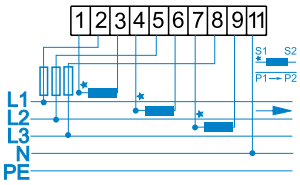
[1)] Controlled by 1 input
[2)] Controlled by 2 inputs

DELTAplus
Wiring diagrams

Transformer connected

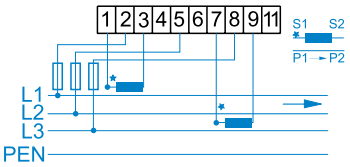
Three phase system

- With neutral conductor, 4 wire (DAB13XXX)



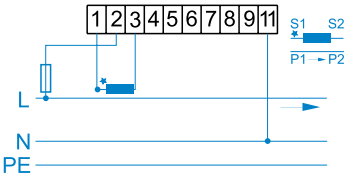
Three phase sytem

- Without neutral conductor, 3 wire (DAB12XXX)



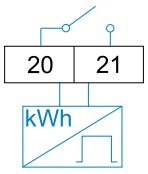
One phase system

- With neutral conductor (DAB11XXX)



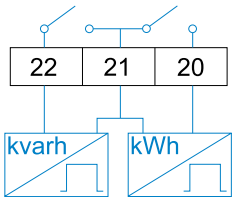
Pulse output. External power supply up to 247 V AC or DC

- Active energy meters

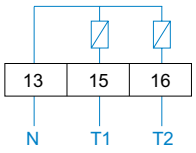


Pulse output. External power supply up to 247 V AC or DC

- Combined meters



Tariff input. Control by external power supply up to 230 V

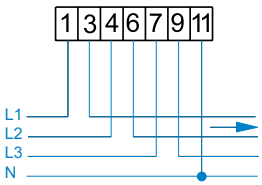


T1 = Tariff input 1
T2 = Tariff input 2

Direct connected meters

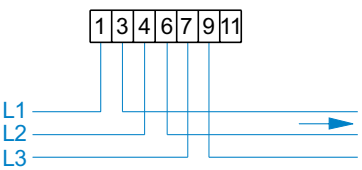
Three phase system

- With neutral conductor, 4 wire (DBB23XXX)



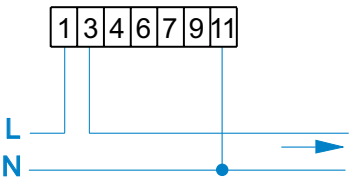
Three phase system

- Without neutral conductor, 3 wire (DBB22XXX)



One phase system

- Phase and neutral (DBB21XXX)



DELTAplus
Technical data

Three phase meter, direct connection up to 80A		Types DBx and DDx	Types DAx and DCx
Voltage (V)	Nominal voltage AC	3 x 57-288/100-500 (4-wire) 3 x 100-500 (3-wire) 1 x 57-288 (single phase)	
	Voltage range	-20% to +15% of nominal voltage	
Current (A)	I_{min}	0.25	0.01
	I_{tr}	0.50	0.005
	I_{ref} (I_b)	5	-
	I_n	-	1.0
	I_{max}	80	6
	I_{st}	20 mA	2mA
General data	Frequency (Hz)	50/60	50/60
	Frequency range	± 5%	± 5%
	Accuracy Class	B or A (Cl. 1 or Cl. 2)	B (Cl. 1)
	Power consumption current circuits at 230 VAC and I_{ref}	0.007 VA, 0.007W per phase	0.001 VA, 0.001W per phase
	Power consumption voltage curcuits	0.5 VA, 0.5 W total	0.5 VA, 0.5 W total
Standards	MID approval according to	EN 50470-1, EN 50470-3	
	International approlval according to	IEC 62052-11, IEC 62053-21, IEC 62053-23	
Memory back-up		EEprom	
Clock back-up		N/A	
Clock accuracy		N/A	
Temperature range (°C)	Operating	-40 to +55	
	Storage	-40 to +70	
Transformer ratio	Voltage transformer ratio	N/A	1 - 9 999
	Current transformer ratio	N/A	1 - 9 999
	Max transformer ratio	N/A	CT x VT max 999 999
Enclosure material	Upper	Polycarbonate	
	Lower	Glassfibre reinforced polycarbonate	
Environment	Mechanical environment	M1	
	Electromagnetical environment	E2	
	Resistance to heat and fire	According to IEC 60695-2-10, IEC 60695-2-11: Terminal 960°C, Cover 650°C	
	Humidity	75% yearly average, 95% on 30 days/year	
Connection area main terminals	Current terminals 1 x mm^2	10 - 25	0.5 - 10
	Voltage terminals 1 x mm^2	N/A	0.5 - 10
Protection against penetration of dust and water	According to IEC 60529	IP 20 on terminal block without protective enclosure *)	
Pulse output	Connection area, main terminals, - 1 x mm^2	0 - 2.5 (For combined meters 0 - 0.5)	
	External pulse voltage		
	- Voltage (V) DC	N/A	
	- Voltage (V) AC/DC	0 - 247 (solid state relay polarity independent)	
	Max. current (mA)	0 - 100	
	Pulse length (ms)	100 (± 2.5)	
	Pulse frequency (imp/kWh)	Programmable (Default 100)	
	Standard	IEC 62053-31(SO)	
LED	Pulse frequency (imp/kWh)	1000	5000 (secondary registering)
	Pulse length (ms)	40	40
Display		LCD with 7 digits, height 7 mm	
Electromagnetic compability (EMC)	Impuls voltage test (kV)	6, 1.2 / 50µs (IEC 60060-1, HD 588.1 S1)	
	Fast transient burst test (kV)	4 (IEC 61000-4-4)	
	Radio frequency immunity	80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3)	
	Electrostatic discharge (ESD) (kV)	15 (IEC 61000-4-2)	
Tariff inputs (optional)	Max. voltage (V) AC	276	
	Max. wire size (mm^2)	2.5	
	Input voltage range (V) AC	57 - 276 (”voltage on”) 0 - 20 (”voltage off”)	
Terminal wire area (mm^2)	M-Bus	0 - 2.5	
	LonWorks FTT-10A	0 - 2.5	
Dimensions	Width (mm)	122.5	
	Height (mm)	97	
	Depth (mm)	64.8	
	DIN modules	7	

*) To comply with the protection requirements the meter must be mounted in a class IP 51 enclosure or better, acc to IEC 60529.

DELTAmax
Product brief

Key applications

- Billing applications
- Applications in Commercial buildings
- Application in Industry
- Object metering

Meter performance

- 3 phase
- Direct connected up to 80 A
- Transformer connected 1, 2 or 5 A
- Active or active and reactive energy
- Accuracy class B (Cl .1)

- Wide voltage range (100 – 500 V AC)
- LCD with 7 digits (7 mm digits)
- Optional 2 or 4 tariffs
- Tariff control via internal clock
- Previous values (daily or monthly)
- Load profile (15, 30 or 60 min interval)
- Max demand (15, 30 or 60 min interval)
- Current harmonics and Total Harmonic Distortion (THD) (up to 9th harmonic)
- Event log
- Power outage time
- Time controlled outputs
- Low power consumption

Communication

- Pulse output
- Built-in M-Bus interface
- IR port for Serial Communication Adapter

Installation

- 7 DIN modules width
- Terminal according to DIN 43857 (“Utility terminal”)
- Automatic installation check
- Wide temperature range
- Sealable push buttons for configuration
- Scroll eye for safe browsing of data and settings

Approvals

- MID type approval “annex B”
- MID initial verification “annex D”
- IEC type approval

DELTAmax
Description

The DELTAplus is an advanced four quadrant meter for installation in three phase networks. The meter is mounted on a DIN rail and is suitable for installation in distribution boards and small enclosures such as consumer units. The meter measures active or combined (active and reactive) energy. The product supports a wide voltage range and a wide temperature range which makes it suitable for installation in many applications.

General features

DELTAmax has a lot of functionality. The built-in clock function is used to log meter data in a load profile or control the setting of tariffs. It is easy to read the large LCD display with 7 mm high digits and symbols for load indication, errors etc. The meter has LED on the front that flashes proportionally to the measured energy. The energy consumption of the meter is very low, less than 0.6 VA.

Communication

Data from DELTAmax is collected via pulse output or serial communication. The pulse output is a polarity independent solid state relay that generates pulses proportionally to the measured energy. DELTAmax can be equipped with a built-in communication interface for M-Bus. All DELTAmax meters come with an infrared port for communication with an external Serial Communication Adapter (SCA). There are SCAs for M-Bus, RS-232, Ethernet and GSM/GPRS.

Tariffs

The DELTAmax range includes meters for 2 and 4 tariffs. The tariffs are controlled via internal clock or via communication.

Instrumentation

Through the instrumentation functionality of DELTAmax, the following electrical properties can be read

- Active power (per phase and total)
- Apparent power (per phase and total)
- Reactive power (per phase and total)
- Current (per phase)
- Voltage (per phase)
- Frequency
- Power factor
- Active quadrant
- Total current harmonic distortion

Inputs and outputs

DELTAmax support two I/O's. It can be two inputs or two outputs or one of each. Outputs can be used for controlling external apparatus like a contactor or an alarm (max 120 mA). Inputs can be used for counting pulses from e.g. a water meter, or for reading status from external devices.

Configuration

The configuration of DELTAmax is simple. Using the two buttons scroll and set you can configure transformer ratio, pulse frequency, M-Bus address and baud rate when applicable. The two push buttons are under a sealable cover. When they are sealed, the scroll eye on the front of the meter can be used for reading the parameters and also instrument values.

Installation

DELTAmax comes with an automatic installation check that indicates problems in the installation.

Approval

DELTAmax is type approved according to IEC and it is both type approved and verified according to MID. MID is the Measuring Instruments Directive 2004/22/EC from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA.

The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.

DELTAmax
Special features - RTC, PV, LP, MD, log and THD

DELTAmax has an internal clock that handles a number of time dependent functions such as load profile, maximum demand, previous values, event and quality log, time controlled outputs and tariffs. The data from these functions are only readable via serial communication. When all available memory for a time dependent function is used, the oldest data record for that function will be over-written. Changing interval length or number of values to stored in a function will reset all values stored.

Internal clock

The internal clock, sometimes called real time clock or RTC, has a built-in calendar and keeps automatically track of leap year and daylight savings time (DST). The DST function is optional.

Backup of the clock during a power failure is provided by a supercapacitor. The time is controlled from a quartz crystal based clock.. Time and date is set via push buttons or via communication.

The internal clock is approved according to IEC 62052-21 and IEC 62054-21. These standards specify the requirements for time switches in electricity meter related products. The accuracy is better than 5 ppm at room temperature.

Previous values

The previous value feature will store all energy registers and input counter values together with a date/time stamp upon change of day or month. All total values are stored and in meters equipped with the tariff feature all the tariff registers will also be stored.

Load Profile

The load profile stores the energy consumption at pre-defined intervals. The interval lengths are 15, 30 or 60 minutes. The default value is 60 minutes.

The quantities that can be stored for each interval are active and reactive energy, both imported and exported energy, and the number of pulses registered on input 1 and 2. Storage of reactive energy is only possible on meters measuring combined energy and storing of pulses requires that the meter is equipped with the corresponding number of inputs.

The load profile function uses the standard time setting irrespective if the daylight savings time function is activated or not.

Maximum Demand

In the maximum demand function, the mean power in each interval is measured and the maximum mean values are stored together with a date/time stamp. The interval lengths are 15, 30 or 60 minutes. The default value is 15 minutes.

For each set of maximum demand values the end date/time of the period is stored.

The quantities that can be stored for each interval are active and reactive energy (imported energy only), and the number of pulses registered on input 1 and 2. Storage of reactive energy is only possible on meters measuring combined energy and storing of pulses requires that the meter is equipped with the corresponding number of inputs. In tariff meters, the maximum demand is stored for each tariff.

Event log

The event log function logs the following events:

- Overvoltage on each phase (+6%)
- Undervoltage level 1 on each phase (-10%)
- Undervoltage level 2 on each phase (-15%)
- Phase voltage outage (-15%)
- Negative power
- Total power outage
- Presence of current harmonics

For the over- and undervoltage events a percentage level with respect to a nominal voltage is given which is programmable. The phase voltage outage level use the same level as undervoltage level 2. The negative power event will be logged if abnormal negative power is detected.

For current harmonics a percentage level for the total harmonic distorsion of the harmonics measured can be set and the event will be logged if that limit is exceeded.

THD

The current harmonics (2-9) together with the fundamental is measured sequentially one at a time (approximately 1 harmonic each second). The total current harmonic distortion of the harmonics measured is displayed in percent. The separate harmonic frequencies measured are multiples of the fundamental frequency (normally around 50 or 60 Hz) up to the 9th harmonic but not higher than 500 Hz. At 60 Hz for example the 9th harmonic will have frequency 540 Hz and will then not be measured.

THD data is displayed on the LCD. THD data and data for individual harmonics can be read out via serial communication.

DELTAmax
Ordering data

Active import and export measurement, 3 phase, Class B (Cl. 1), Verified and approved according MID, IEC approval

CTVT connected electricity meter

3 phase meter, 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139495R1000	DEB 13005	3x57-288/100-500V	B (Cl. 1)	2[1]	Yes	Yes	0.338
2CMA139496R1000	DEB 13006	3x57-288/100-500V	B (Cl. 1)	4[1]	Yes	Yes	0.338
2CMA139497R1000	DEB 13007	3x57-288/100-500V	B (Cl. 1)	[2]	Yes	Yes	0.338

CTVT connected electricity meter, M-Bus over Twisted pair

3 phase meter, 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139549R1000	DEM 12007	3x100-500V	B (Cl. 1)	[2]	Yes	Yes	0.325
2CMA139498R1000	DEM 13005	3x57-288/100-500V	B (Cl. 1)	2[1]	Yes	Yes	0.345
2CMA139499R1000	DEM 13006	3x57-288/100-500V	B (Cl. 1)	4[1]	Yes	Yes	0.345
2CMA139500R1000	DEM 13007	3x57-288/100-500V	B (Cl. 1)	[2]	Yes	Yes	0.345

Direct connected electricity meter

3 phase meter, 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139502R1000	DFB 13005	3x57-288/100-500V	B (Cl. 1)	2[1]	Yes	Yes	0.379
2CMA139503R1000	DFB 13006	3x57-288/100-500V	B (Cl. 1)	4[1]	Yes	Yes	0.379
2CMA139504R1000	DFB 13007	3x57-288/100-500V	B (Cl. 1)	[2]	Yes	Yes	0.379

Direct connected electricity meter, M-Bus over Twisted pair

3 phase meter, 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139508R1000	DFM 12007	3x100-500V	B (Cl. 1)	[2]	Yes	Yes	0.362
2CMA139505R1000	DFM 13005	3x57-288/100-500V	B (Cl. 1)	2[1]	Yes	Yes	0.386
2CMA139506R1000	DFM 13006	3x57-288/100-500V	B (Cl. 1)	4[1]	Yes	Yes	0.386
2CMA139507R1000	DFM 13007	3x57-288/100-500V	B (Cl. 1)	[2]	Yes	Yes	0.386

[1] Controlled by internal clock or communication, time dependent functions
[2] Time dependent functions

DELTAmax
Ordering data

Active and reactive import and export measurement, 3 phase, Class B (Cl. 1), Verified and approved according MID, IEC approval

CTVT connected electricity meter

3 phase meter, 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139509R1000	DGB 13005	3x57-288/100-500V	B (Cl. 1)	2[1)]	Yes	Yes	0.338
2CMA139510R1000	DGB 13006	3x57-288/100-500V	B (Cl. 1)	4[1)]	Yes	Yes	0.338
2CMA139511R1000	DGB 13007	3x57-288/100-500V	B (Cl. 1)	[2)]	Yes	Yes	0.338

CTVT connected electricity meter, M-Bus over Twisted pair

3 phase meter, 6A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139517R1000	DGM 12007	3x100-500V	B (Cl. 1)	[2)]	Yes	Yes	0.325
2CMA139512R1000	DGM 13005	3x57-288/100-500V	B (Cl. 1)	2[1)]	Yes	Yes	0.345
2CMA139513R1000	DGM 13006	3x57-288/100-500V	B (Cl. 1)	4[1)]	Yes	Yes	0.345
2CMA139514R1000	DGM 13007	3x57-288/100-500V	B (Cl. 1)	[2)]	Yes	Yes	0.345

Direct connected electricity meter

3 phase meter, 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139518R1000	DHB 13005	3x57-288/100-500V	B (Cl. 1)	2[1)]	Yes	Yes	0.379
2CMA139519R1000	DHB 13006	3x57-288/100-500V	B (Cl. 1)	4[1)]	Yes	Yes	0.379
2CMA139520R1000	DHB 13007	3x57-288/100-500V	B (Cl. 1)	[2)]	Yes	Yes	0.379

Direct connected electricity meter, M-Bus over Twisted pair

3 phase meter, 80A

Order code	Type	Voltage (V)	Accuracy Class	No. of tariffs	IR port	Pulse output	Weight kg
2CMA139524R1000	DHM 12007	3x100-500V	B (Cl. 1)	[2)]	Yes	Yes	0.362
2CMA139521R1000	DHM 13005	3x57-288/100-500V	B (Cl. 1)	2[1)]	Yes	Yes	0.386
2CMA139522R1000	DHM 13006	3x57-288/100-500V	B (Cl. 1)	4[1)]	Yes	Yes	0.386
2CMA139523R1000	DHM 13007	3x57-288/100-500V	B (Cl. 1)	[2)]	Yes	Yes	0.386

[1)] Controlled by internal clock or communication, time dependent functions
[2)] Time dependent functions

DELTAmax
Technical data

Three phase meter, direct connection up to 80A		Types DFx and DHx	Types DEx and DGx
Voltage (V)	Nominal voltage AC	3 x 57-288/100-500 (4-wire) 3 x 100-500 (3-wire) 1 x 57-288 (single phase)	
	Voltage range	-20% to +15% of nominal voltage	
Current (A)	I_{min}	0.25	0.01
	I_{tr}	0.50	0.05
	I_{ref} (I_b)	5	-
	I_n	-	1.0
	I_{max}	80	6
	I_{st}	20 mA	2 mA
General data	Frequency (Hz)	50/60	50/60
	Frequency range	± 5%	± 5%
	Accuracy Class	B (Cl. 1)	B (Cl. 1)
	Power consumption current circuits at 230 VAC and I_{ref}	0.007 VA, 0.007W per phase	0.001 VA, 0.001W per phase
	Power consumption voltage curcuits	0.5 VA, 0.5 W total	0.5 VA, 0.5 W total
Standards	MID approval according to	EN 50470-1, EN 50470-3	
	International approlval according to	IEC 62052-11, IEC 62053-21, IEC 62053-23	
Memory back-up		EEprom	
Clock back-up	Super Cap. typically 168 hours back-up at +20°C, min 72 hours over operating temperature range		
Clock accuracy		IEC 62052-11, IEC 62054-21	
Temperature range (°C)	Operating	-40 to +55	
	Storage	-40 to +70	
Transformer ratio	Voltage transformer ratio	N/A	1 - 9 999
	Current transformer ratio	N/A	1 - 9 999
	Max transformer ratio	N/A	CT x VT max 999 999
Enclosure material	Upper	Polycarbonate	
	Lower	Glassfibre reinforced polycarbonate	
Environment	Mechanical environment	M1	
	Electromagnetical environment	E2	
	Resistance to heat and fire	According to IEC 60695-2-10, IEC 60695-2-11: Terminal 960°C, Cover 650°C	
	Humidity	75% yearly average, 95% on 30 days/year	
Connection area main terminals	Current terminals 1 x mm^2	1.0 - 25	0.5 - 10
	Voltage terminals 1 x mm^2	N/A	0.5 - 10
Protection against penetration of dust and water	According to IEC 60529	IP 20 on terminal block without protective enclosure *)	
Pulse output	Connection area, main terminals, - 1 x mm^2	0 - 2.5 (For comb. meters 0 - 0.5)	
	External pulse voltage		
	- Voltage (V) DC	N/A	
	- Voltage (V) AC/DC	0 - 247 (solid state relay polarity independent)	
	Max. current (mA)	0 - 100	
	Pulse length (ms)	100 (± 2.5)	
	Pulse frequency (imp/kWh)	Programmable (Default 100)	Programmable (Default 10)
	Standard	IEC 62053-31(SO)	
LED	Pulse frequency (imp/kWh)	1000	5000(secondary registering)
	Pulse length (ms)	40	40
Display		LCD with 7 digits, height 7 mm	
Electromagnetic compability (EMC)	Impuls voltage test (kV)	6, 1.2 / 50µs (IEC 60060-1, HD 588.1 S1)	
	Fast transient burst test (kV)	4 (IEC 61000-4-4)	
	Radio frequency immunity	80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3)	
	Electrostatic discharge (ESD) (kV)	15 (IEC 61000-4-2)	
Tariff inputs (optional)	Max. voltage (V) AC	276	
	Max. wire size (mm^2)	2.5	
	Input voltage range (V) AC	57 - 276 ("voltage on") 0 - 20 ("voltage off")	
Terminal wire area (mm^2)	M-Bus	0 - 2.5	
	LonWorks FTT-10A	N/A	
Dimensions	Width (mm)	122.5	
	Height (mm)	97	
	Depth (mm)	64.8	
	DIN modules	7	

*) To comply with the protection requirements the meter must be mounted in a class IP 51 enclosure or better, acc to IEC 60529.

DELTAplus/max

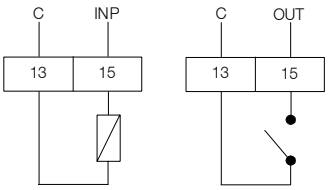
Generic information - wiring diagram, pulse frequence

Inputs or Outputs

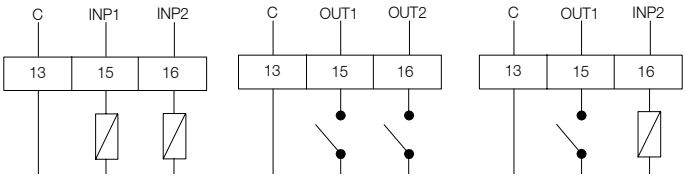
The meter is available with various input and output as options. The input can be used as an alarm or as a pulse counter, e.g., for a water meter. The output can be used as ON and OFF function, for example to switch off the current by remote control.

The inputs/outputs are of opto-switch type and are galvanic isolated from other electronics parts in the meter. There are two input/output voltage variants; high and low, (see technical data). Both variants are for AC/DC voltage and are of polarity independent.

LonWorks meters



M-Bus and standard meters



Technical data input/output

Input, Max Wire size 2.5 mm2

Data for low voltage inputs:
- Voltage range 0 - 40 V AC/DC
- 0 V to 2 V is interpreted as ”off”
- 4.5 V to 40 V is interpreted as ”on”
- Input resistance: 8 - 13 kΩ.
- Power consumption: Less than U * U / 8000 where U is voltage in volts.
- Minimum pulse length and pause: 30 ms

Data for high voltage inputs:
- Voltage range 0 – 276 V AC/DC.
- 0 V to 20 V AC/DC is interpreted as “off “.
- 45 V to 276 V AC/DC is interpreted as “on“.
- Input resistance: 80 - 85 kΩ.
- Power consumption: Less than U * U / 80000 where U is voltage in volts.
- Minimum pulse length and pause: 30 ms

Output

Data for low voltage outputs:
- Voltage range 0 - 40 V DC/AC
- Output resistance: 12 - 25 Ω.
- Maximum current: 100 mA.

Data for high voltage outputs:
- Voltage range 0 - 400 V DC, 0 - 282 V AC.
- Output resistance: 30 - 55 Ω.
- Maximum current: 100 mA

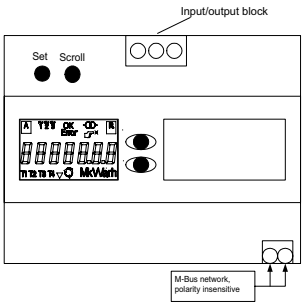
M-Bus Protocol

The protocol is based on international standard IEC 60870. The bus system is adapted for remote reading of energy meters and works on the principle of master slave.

Baud rate

300, 600, 1200, 2400 (default), 4800, 9600

Installation (M-Bus)



LonWorks Protocol *)

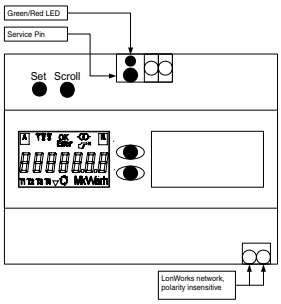
The software is compatible with Lon Mark 3.2 and uses the LonMark-profile Utility Data Logger 1.0. A description of network variables can be found noted in the DELTAplus/DELTAmax User’s Manual.

Technical information (LonWorks) *)

Operating and display elements:
Service pin and LED.
Bus interface: FTT-10A.
Communication rate: 78 kbps.

A software clock is implemented in the LonWorks interface to enable readings from meter to be time-recorded.
The accuracy is ± 2 seconds per 24 hours.

Installation (LonWorks) *)



***) LonWorks is not available for DELTAmax**

For more information see "DELTAplus/DELTAmax Meter User’s Manual" at **www.abb.com/lowvoltage.**
«Modular DIN Rail Products»«Electricity meters for DIN Rail»

DELTAmax
Generic information - Time dependent functions

Internal clock and time dependant functions

DELTAmax meter has an internal clock that keeps track of the date and time and is equipped with various time dependant functions such as load profile, maximum demand, previous values, event log, outputs controlled by time and in tariffs.
The tariffs are normally controlled via the internal clock (no external time switch required).

The previous values, load profile, maximum demand and the event log functions are only readable via bus.
Changing the default settings of these functions are only possible by serial communication.
If the time and date are not set no values will be registered.

If all the memory available for a time dependant function is used, the oldest recorded data for that function will be overwritten. Changing interval length or number of values to be stored for a function will reset all values stored.

Internal clock

The internal clock has a built in calendar and keeps automatically track of leap year and daylight savings time (DST).
DST function is optional.

Backup of the clock during a power failure is provided by a supcapacitor. The time is controlled from a quartz crystal based real time clock. Time and date is set via the buttons or via communications.

The internal clock is approved according to IEC 62052-21 and IEC 62054-21 which contains particular requirements for time switches. The stated accuracy is less than 5 ppm at room temperature when controlled from the quartz crystal based real time clock.

Previous values

The monthly value feature will store all energy registers and input counter values altogether with a date/time stamp upon a change of day or month. All total energy values are stored and in meters equipped with the tariff feature all the tariff registers will also be stored. The number of stored monthly values can be set from 0 to 127.

Load profile

In the load profile function each day is divided into intervals of a certain length where the energy consumption in each interval is stored. The possible interval lengths are 15, 30 or 60 minutes. The default value is 60 minutes.

The quantities that can be stored are active and reactive energy with the number of pulses registered on input 1 and 2. Storage of reactive energy is possible on combined meters only and storing of pulses requires meters with corresponding input.

The load profile function always use standard time irrespective if the DST (daylight savings time) function is active or not.

Maximum demand

In the maximum demand function the time is divided into intervals of a certain length and the mean power in each interval is measured and the maximum mean value is stored together with a date/time stamp. The possible interval lengths are 15, 30 or 60 minutes and is programmable. Default value 15.

For each set of maximum demand values the end date/time of the period is stored.

The quantities that can be stored are active and reactive power and number of pulses registered on input 1 and 2 (pulses/interval). In tariff meters the maximum demand is stored for each tariff.

The maximum number of maximum demand values to be stored are programmable from 0 up to 127.

Event log

The event log function can log the following events:

- Overvoltage on each phase (+6%)
- Undervoltage level 1 on each phase (-10%)
- Undervoltage level 2 on each phase (-15%)
- Phase voltage outage (-15%)
- Negative power
- Total power outage

For the over- and undervoltage events a percentage level in respect to a nominal voltage is given which is programmable.

For each registered event the start date/time and the duration (in seconds) is stored.

The number of events to be stored are programmable from 0 up to 255.

Communication adapters
Description

The Serial Communication Adapter (SCA) enables serial data communication between the electricity meter and an Automatic Meter Reading system (AMR).

The adapter for ABB DIN rail mounted electricity meters

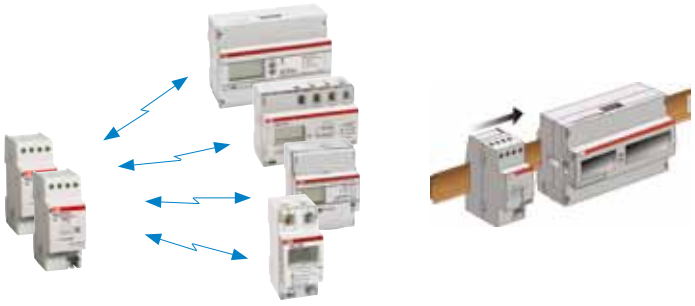
The electricity meter has an infrared port for remote reading of its measured data and identity, using the M-Bus protocol.

The SCA is an interface between the infrared port and the external communication.

- Installation on a DIN rail
- Compact size
- Easy installation

Installation

The SCA is installed on the left hand side of the meter. The infrared port on ABB meter must face the infrared port on the right side of the SCA. It is important that the electricity meter and the adapter are installed side by side and that the infrared ports are aligned.

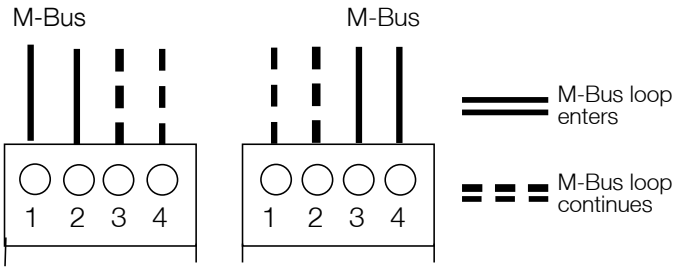


SCA Two-wire M-Bus

The M-Bus adapter can be ordered for two-wire M-Bus usage.

To connect the M-Bus loop, terminals 1-2 or 3-4 can be used. The loop continues on the other two free terminals. The M-Bus two-wire connection is polarity insensitive. The two-wire connection is mainly used when several M-Bus slaves are to be connected into a M-Bus loop.

The adapter is powered directly by the M-Bus and does not require an additional power source. The M-Bus adapter consumes 3 mA i.e. two standard M-Bus loads.



Connecting 2-wire M-Bus

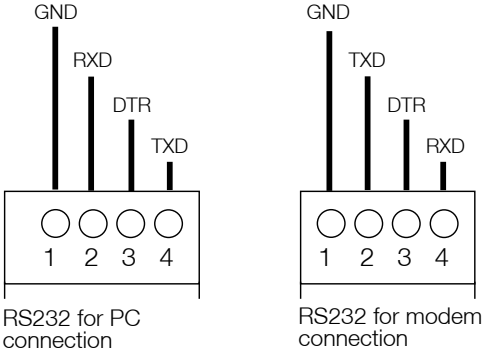
SCA RS232

The RS232 M-Bus connection is used when connecting a M-Bus slave directly to a Master (e.g. PC/modem) without an M-Bus interface.

The table below shows how to connect a M-Bus master computer (PC). To connect to a M-Bus repeater (MODEM) switch RXD <> TXD in table 1.

Terminal no	Function	9-pole connector	25-pole connector
1	GND --	5	7
2	TXD <-	3	2
3	DTR >-	4	20
4	RXD ->	2	3

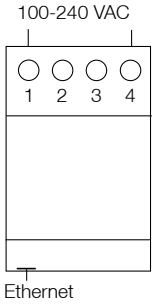
Connecting M-Bus Master (PC) with R232 port to the ABB adapter.



RS232 for PC connection

RS232 for modem connection

Communication adapters
Description



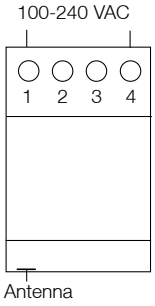
SCA Ethernet M-Bus

The Ethernet adapter is used for communication over Ethernet networks.
The data is communicated using M-Bus over UDP or TCP. The adapter also has built in web server. The web server can be accessed through a standard web browser in a PC using the IP address of the adapter.

The Ethernet adapter is powered by 100 – 240 VAC (-20/+15%) between terminal 1 and 4. To connect to an Ethernet network a RJ-45 connector is used.

SCA GSM/GPRS M-Bus

The GSM/GPRS communication adapter is a quad band GSM/GPRS device, which enables communication with GSM or GPRS over GSM 850/900 and GSM 1800/1900 networks. The ABB GSM/GPRS communication adapter support remote configuration using Short Message Service (SMS), which provides flexible configuration of the adapter. It is also possible to read essential meter data via SMS commands.
The adapter is powered with 100-240 VAC (-15/+10%).



SCA M-Bus extender

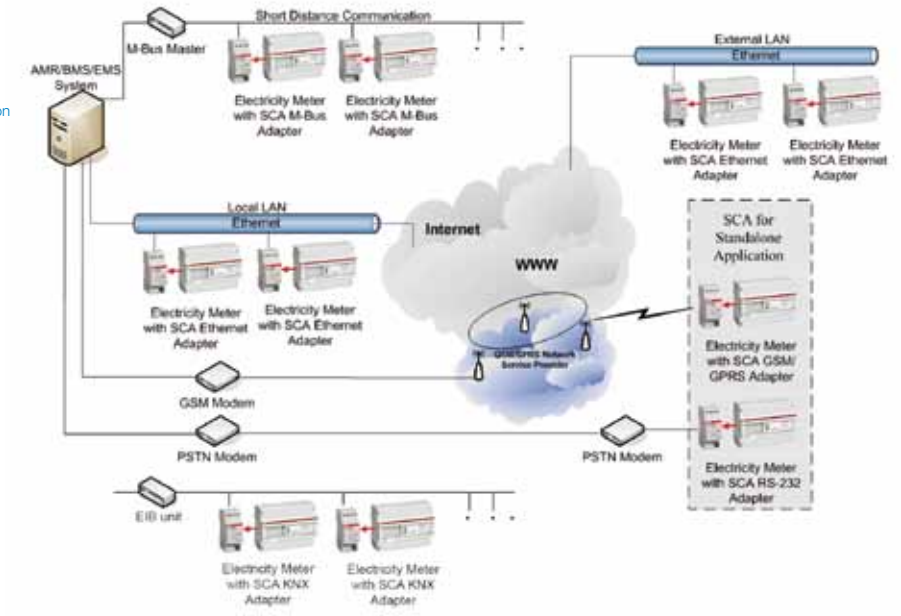
The M-Bus extender makes it possible to expand your SCA with up to 32 extra M-Bus units. The M-Bus extender features standard M-Bus over IR communication and is equipped with the unique IR-Pass Through function, making the product series stackable.The M-Bus extender is only for use with M-Bus networks using M-Bus addressing.

SCA/KNX interface module

The SCA/KNX interface module is used to connect the meter to an EIB/KNX installation. The KNX module converts the M-Bus telegrams to KNX variables. Some M-Bus data is not available through this adapter.

Abbreviations

AMR	Automatic Meter Reading
BMS	Building Management System
EMS	Energy Management System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
LAN	Local Area Network
PSTN	Public Switched Telephone Network
SCA	Serial Communication Adapter



Communication adapters
Ordering data

Serial Communication Adapter enables serial data communication between the elctricity meter and data management systems.

Communication adapter, M-Bus over Ethernet

Order code	Type	Voltage (V)	IR port output	Weight kg
2CMA137121R1000	CEM 05100	100-240 V	Yes	

Communication adapter, M-Bus over GSM/GPRS

Order code	Type	Voltage (V)	IR port output	Weight kg
2CMA137104R1000	CGM 05000	100-240 V	Yes	0.105

Communication adapter, M-Bus Master for 32 M-Bus units

Order code	Type	Voltage (V)	IR port output	Weight kg
2CMA137120R1000	CMM 05000	100-240 V	Yes	0.070

Communication adapter, M-Bus over RS232

Order code	Type	Voltage (V)	IR port output	Weight kg
2CMA137091R1000	CRM 04000	-	Yes	0.072

Communication adapter, M-Bus over Twisted pair

Order code	Type	Voltage (V)	IR port output	Weight kg
2CMA137090R1000	CTM 04000	-	Yes	0.073

Communication adapter, EIB/KNX

Order code	Type	Voltage (V)	IR port output	Weight kg
2CDG110083R0011	ZS/S 1.1	-	Yes	0.067

Accessories
Ordering data

Accessories for electricity energy meters.

DIN-rail

Order code	Type	Type of electricity meter	Application	Weight kg
2CMA132540R1000	DIN-rail	DELTAplus	Wall mounting	0.025
2CMA139501R1000	DIN-rail	DELTAsingle	Wall mounting	0.025

Cover

Order code	Type	Type of electricity meter	Application	Weight kg
2CMA132633R1000	Long cover	DELTAplus	Wall mounting	0.070
2CMA131026R1000	Short cover	ODIN	Sealing	0.025

Front mounting kit

Order code	Type	Type of electricity meter	Application	Weight kg
2CMA132635R1000	Front mounting kit	DELTAplus and ODIN	Panel mounting	0.200

Enclosure

Order code	Type	Type of electricity meter	Application	Weight kg
2CMA131022R1000	Enclosure (6 modules)	ODIN	Wall mounting	0.500

Measuring Instruments Directive (MID)
information

Getting to terms with the MID

The Measuring Instruments Directive (MID) is a relatively new term. MID was introduced by the European Commission in 2004 to promote the free trade of measuring instruments and provide common rules for their use. As European Directive 2004/22/EC, MID came fully into force on October 30th, 2006.

Instruments must meet the essential requirements of the directive plus one of ten instrument-specific annexes. For electricity meters, this is MI-003 (active electrical energy meters). Approval to MID is required for meters used in billing applications and preferable in many related areas, e.g. joint residential sourcing.

Creates a single EU instrument market

The aim of the directive is to create a single market in measuring instruments for the benefit of manufacturers and, ultimately, consumers across Europe. National rules that deviate from MID are not allowed. With an MID 'European Type Approval Certificate', an instrument can be sold and used in any EU (or EEA) member state.

Routes to certification

MID stipulates requirements in three areas; climate conditions (e.g. how different temperature zones affect requirements), mechanical environments and electromagnetic environments.

WELMEC, a committee whose principal aim is to establish a harmonized and consistent approach to European legal metrology (metering), draws up design guidelines for electricity meters. These are then standardized by CENELEC, the European Committee for Electrotechnical Standardization, as standards EN 50470-1, -2 and -3.

MID makes it clear that there are several ways to certify products such as electricity meters. ABB has chosen type approval according to Annex B and initial verification according to Annex D.

Type approval and initial verification via NMi

According to MID, type approval follows the directive's Annex B; the product must fulfill relevant parts of EN 50470 and be assessed by a Notified Body that then issues a certificate for that product. We use NMi, an independent expert for metrology testing, certifying and calibrating, for this task.

ABB has selected to do initial verification. This means that all ABB meters described here are individually tested to ensure that they are equivalent to the type approval.

Accredited calibration laboratory and audits ensure compliance

To ensure that the calibration and verification of ABB electricity meters meet MID demands, we have our own accredited calibration laboratory that operates under the auspices of SWEDAC, the Swedish Board for Accreditation and Conformity Assessment. Each meter is stamped with the code SE1818, showing that it has been calibrated and approved in this laboratory.

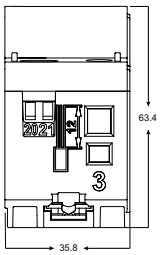
Finally, own manufacture with an accredited laboratory and Annex D approval means that both NMi and SWEDAC perform regular audits to ensure that our processes and tools perform as required.

Every electricity meter made by ABB is type approved, verified and issued with a certificate of compliance according to MID requirements.

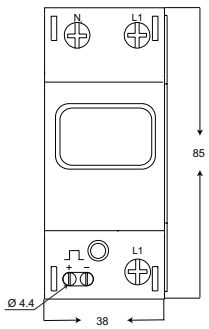
Dimensions
ODINsingle, ODIN

ODINsingle

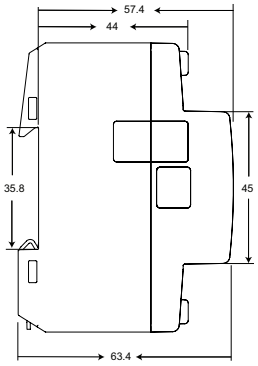
Bottom view, terminal area



Front view

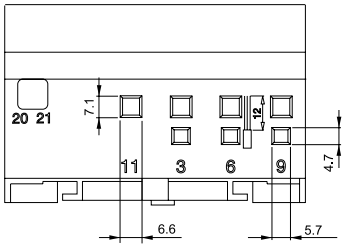


Side view

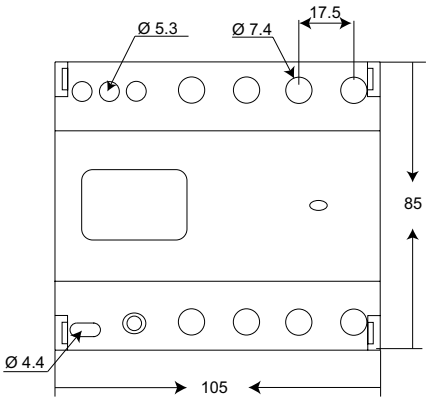


ODIN

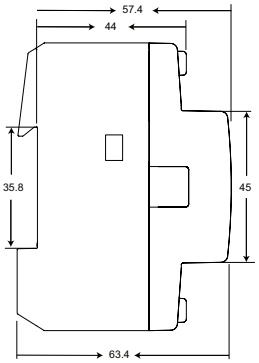
Bottom view, terminal area



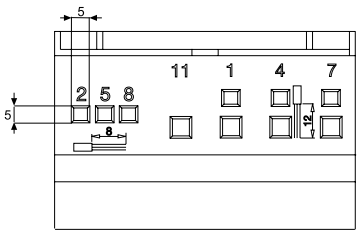
Front view



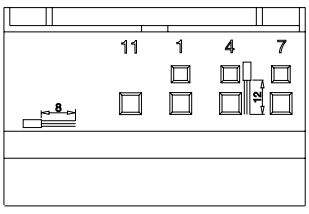
Side view



Terminal area, transformer connected meter



Terminal area, direct connected meter

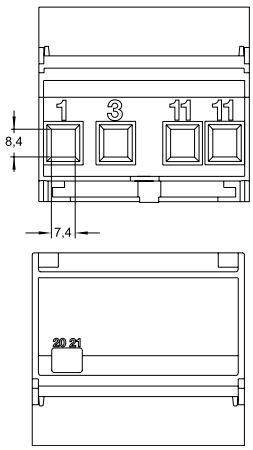


Dimensions in mm

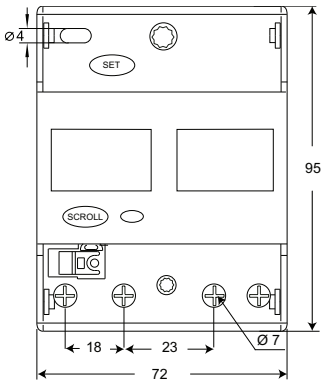
Dimensions
DELTAsingle, DELTAplus, DELTAmax

DELTAsingle

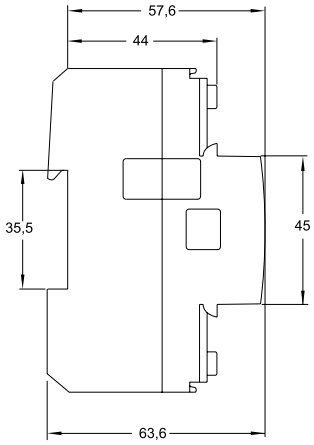
Bottom view, terminal area



Front view

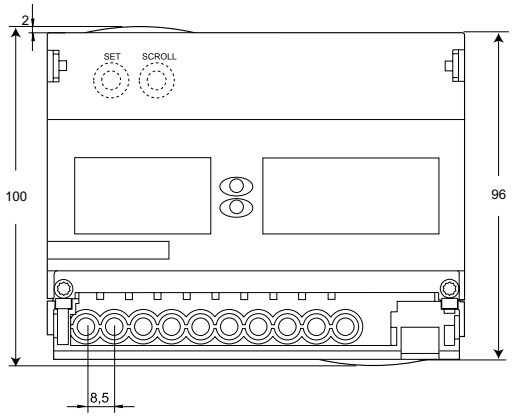


Side view

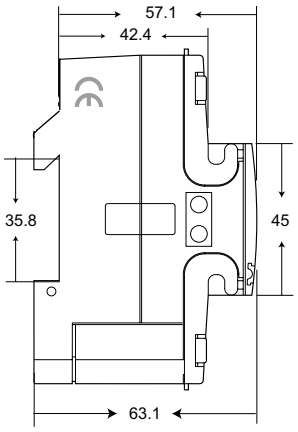


DELTAplus/DELTAmax

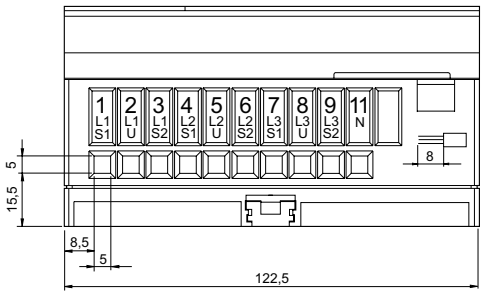
Front view, all meters



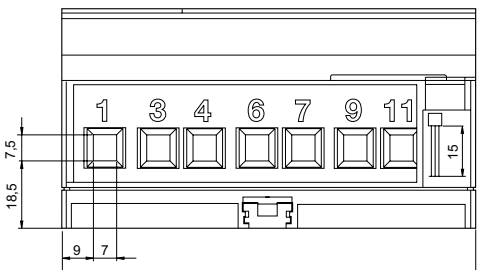
Side view, all meters



Bottom view, Terminal area, transformer connected meter



Bottom view, Terminal area, direct connected meter

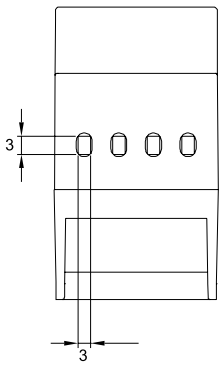


Dimensions in mm

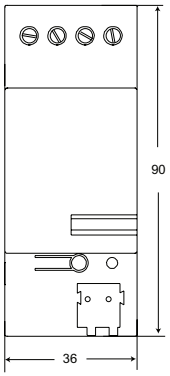
Dimensions
Serial communication adapter

Serial communication adapter

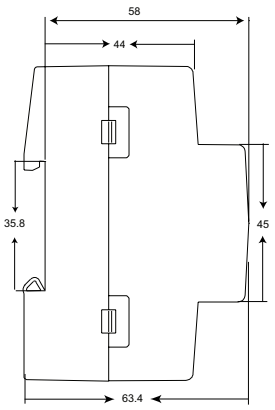
Top view, terminal area



Front view



Side view



Dimensions in mm

Cross reference
Meter type - Order code

Type	Order code	Page
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CGM 05000	2CMA137104R1000	44
CMM 05000	2CMA137120R1000	44
CRM 04000	2CMA137091R1000	44
CTM 04000	2CMA137090R1000	44
DAB 11000	2CMA180819R1000	26
DAB 11001	2CMA139006R1000	26
DAB 11002	2CMA139464R1000	26
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Type	Order code	Page
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FBU 11206	2CMA180895R1000	18
Front mounting kit	2CMA132635R1000	45
Long cover	2CMA132633R1000	45
OD1065	2CMA131040R1000	14
OD1365	2CMA131041R1000	14
OD4110	2CMA131025R1000	22
OD4165	2CMA131024R1000	22
Short cover	2CMA131026R1000	45
ZS/S 1.1	2CDG110083R0011	44

Cross reference
Order code - Meter type

Order code	Type	Page
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2CMA131024R1000	OD4165	22
2CMA131025R1000	OD4110	22
2CMA131026R1000	Short cover	45
2CMA131040R1000	OD1065	14
2CMA131041R1000	OD1365	14
2CMA132540R1000	DIN-rail	45
2CMA132633R1000	Long cover	45
2CMA132635R1000	Front mounting kit	45
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Order code	Type	Page
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2CMA180922R1000	DBM 23020	30
2CMA180923R1000	DBM 22001	30
2CMA180924R1000	DBM 22002	30

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